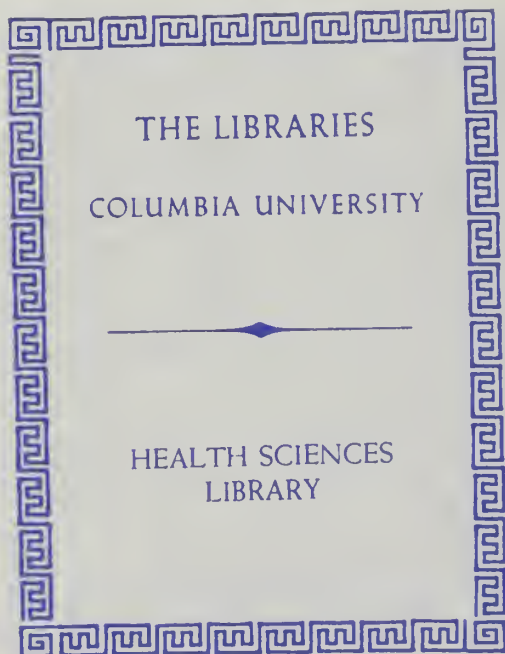


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Columbia-Presbyterian Medical Center

COMBINED ANNUAL REPORT 1978



College of Physicians and Surgeons
Columbia University in the City of New York

The Presbyterian Hospital
In the City of New York

Stacks

TWENTIETH COMBINED ANNUAL REPORT

of the

COLUMBIA-PRESBYTERIAN MEDICAL CENTER

622-630 West 168th Street, New York, N.Y. 10032



College of Physicians and Surgeons • Columbia University
in the City of New York

The Presbyterian Hospital in the City of New York
and

School of Dental and Oral Surgery • Columbia University
in the City of New York

December 31, 1978

Serial
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This report is dedicated to the most important person in the Medical Center, the patient; to those entrusted with his care and those who through their training are preparing to care for him.

The Medical Center comprises modern buildings and facilities for the carrying out of patient care, closely integrated with teaching and research. But it is the 10,000 people who serve and study within the Hospital and College, who give life and breath to this concept.

“Those who serve” include every worker—professional, non-professional, student and volunteer. These are the people who provide the best in patient care today and contribute toward advancement in health and medical science tomorrow.

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Origin and Functions of the Columbia-Presbyterian Medical Center

The Medical Center, comprising a group of long established hospitals of high standing and the College of Physicians and Surgeons of Columbia University, furnishes an integrated program to provide the highest quality of medical care for the sick and injured, to advance knowledge about the cause, prevention and treatment of disease and disability, and to train men and women in the professions of medicine, dentistry, nursing, public health, and allied fields. Through the affiliation between the Hospitals and the University the members of the staffs of the Hospitals are nominated by Columbia University, and teaching and research are conducted in all the Hospitals.

College of Physicians and Surgeons

Columbia University began as King's College, which was founded in 1754 by royal grant of George II, King of England, "for the Instruction of Youth in the Learned Languages, and the Liberal Arts and Sciences." The Revolutionary War interrupted its program, but in 1784, it was reopened as Columbia College. In 1912, the title was changed to Columbia University in the City of New York.

King's College organized a medical faculty in 1767 and was the first institution in the North American Colonies to confer the degree of Doctor of Medicine in course. The first individuals to graduate in medicine from the College were Robert Tucker and Samuel Kissam, who received the degree of Bachelor of Medicine in May, 1769, and that of Doctor of Medicine in May, 1770, and May, 1771, respectively. Instruction in medicine was given until the War of the Revolution. In 1784, instruction was resumed in the academic department. Eight years later, the medical faculty was reestablished. In 1814, the medical faculty of Columbia College was merged with the College of Physicians and Surgeons, which had obtained an independent charter in 1807. In 1860, by agreement between the Trustees of the two institutions, the College of Physicians and Surgeons became the Medical Department of Columbia College; from that time on, the diplomas of the graduates were signed by the President of Columbia College, as well as by the President of the College of Physicians and Surgeons. The connection was only a nominal one, however, until 1891, when the College was incorporated as an integral part of the University. Since September, 1917, women have been admitted to the School on the same basis as men. In 1928, the

College of Physicians and Surgeons moved from its site on West Fifty-Ninth Street to the Medical Center at 168th Street between Broadway and Fort Washington Avenue. In addition to its primary affiliation with Presbyterian Hospital, the College also has major or partial affiliations with Harlem, Roosevelt and St. Luke's Hospitals in New York City; Mary Imogene Bassett Hospital in Cooperstown, N.Y.; Helen Hayes Hospital in West Haverstraw, N.Y., and Overlook Hospital in Summit, N.J.

The School of Public Health

The School of Public Health and Administrative Medicine is an integral part of the medical faculty of Columbia University. The staff provides both graduate and undergraduate instruction and research opportunities in preventive and administrative medicine and in community organization for health services of all types.

The School of Dental and Oral Surgery

In September, 1916, students in dentistry were admitted to courses in Columbia University at the College of Physicians and Surgeons. On March 15, 1917, the Trustees of Columbia University established a School of Dentistry as of September 27, 1916, so that the conduct of courses from that date, as forming part of the work of the School, might be officially recognized.

The School provides undergraduate instruction in dentistry and dental hygiene. Postgraduate courses in the specialties of dentistry and a master's degree in dental hygiene are offered. Clinics, open to the public, are conducted in all areas of dentistry and the Hospital Dental Service is staffed and maintained by the School.

The School of Nursing

In 1935 the College of Physicians and Surgeons of Columbia University assumed responsibility for the educational programs of the School of Nursing of the Presbyterian Hospital, and in 1937 the University established the Department of Nursing of the Faculty of Medicine. In 1974 the Department became known as the School of Nursing of the Faculty of Medicine of Columbia University.

The School of Nursing prepares men and women to practice as individuals and with members of other

disciplines. The baccalaureate program enrolls students who wish to begin the study of nursing as well as those already registered nurses who wish to deepen and broaden their knowledge through general college work and nursing on the senior college level. Liberal arts courses are offered through Barnard and Columbia Colleges and the School of General Studies. Graduate programs afford nurses the opportunity to increase their knowledge and skills with practice in special health care fields.

William Black Medical Research Building

The 20-story William Black Medical Research Building at 168th Street and Fort Washington Avenue is used exclusively for research by P&S faculty. The building, dedicated January 3, 1966, was named for William Black, founder and Chairman of the Board of the Chock Full o' Nuts Corp.

Julius and Armand Hammer

Health Sciences Center—Augustus Long Library

The Health Sciences Center, on the northwest corner of Fort Washington Avenue and 168th Street, was dedicated on October 6, 1976, and in 1977 was named in honor of P&S Alumni Armand Hammer and his father, also an alumnus. The 20-story tower provides facilities for the Augustus Long Library, the Jeremiah Milbank and Margaret Milbank Bogert Teaching Center, the March of Dimes Virginia Apgar Center for Genetics, Nutrition and Human Development, an Audio Visual and multimedia production and distribution center and nine floors of research laboratories for the Cancer Center/Institute of Cancer Research and the Departments of Biochemistry, Microbiology, and Human Genetics and Development.

The Institute of Human Nutrition

The Institute of Human Nutrition was established in 1958 following the endowment of the R.R. Williams Professorship of Nutrition from the Williams-Waterman Fund. The principal objective of the Institute is to provide the specialized training necessary to combat and prevent the effects of malnutrition. Emphasis is placed on the training of medical students, physicians and biochemists. Degrees offered are the Master of Science in nutrition through the Faculty of Medicine and the Ph.D. in nutrition through the Graduate School of Arts and Sciences. The teaching and research program is organized around three divisions: the Division of Growth and Development, the Division of Nutrition and Metabolism, and the Division of Community Nutrition. Teaching and research facilities are located in the

William Black Medical Research Building and at St. Luke's Hospital Center. In addition, the Institute maintains national and international ties with numerous medical schools and research centers.

International Institute for the Study of Human Reproduction

The International Institute for the Study of Human Reproduction was founded in 1965 with a grant from the Ford Foundation, later supplemented by one from the Rockefeller Foundation. Its primary purpose is to do research in the fields of biology, clinical investigation, and the social sciences relevant to the solution of the world population problem. A parallel objective is to study the many complications of the reproductive process affecting human welfare, such as infertility, endocrine disorders, out-of-wedlock pregnancy, marital and other social problems. The Institute incorporates two major centers: The Center for Reproductive Sciences and the Center for Population and Family Health.

Cancer Center/Institute of Cancer Research

The Cancer Research Center was established in 1973. In 1977 it was designated the Cancer Center/Institute of Cancer Research. The Center coordinates, integrates, and facilitates cancer research, education, and patient care in the Health Sciences Faculties of Columbia University and its affiliated hospitals in New York City—Presbyterian, St. Luke's, Roosevelt, and Harlem. The Cancer Center was organized to effect the efficient and cooperative use of all Center resources, maximize the dissemination of information among Center personnel, facilitate the rapid translation of cancer research findings into programs for improving capabilities for the prevention of cancer and the care of patients with cancer, and carry on outreach and control programs in cancer. The Center is charged with the responsibility for research, education, and cancer-patient care by all health professionals.

The Institute of Cancer Research of Columbia University, College of Physicians and Surgeons, was established in 1909 with funds bequeathed to the University by George Crocker. It moved from its original quarters on 116th Street to the campus of the Columbia-Presbyterian Medical Center in 1938. The Institute and Center are fully integrated. The Institute, following the closing of the Francis Delafield Hospital, moved into the Health Sciences Center Cancer Research Laboratories.

The Center is composed of five operational divisions: Basic Science Research, Clinical Research and Patient Care, Education, Outreach and Control Programs, and Administration and Core Facilities.

The Center for Community Health Systems

The Center for Community Health Systems is an interdisciplinary and interdepartmental activity of the Faculty of Medicine whose purpose is to enlist the substantial and varied resources of the University and its affiliated hospitals in a systematic attack on the problems of the organization and delivery of health care.

In 1970 the Faculty of Medicine decided that it should be involved to a greater extent in the problems of health care systems. Over the subsequent year, the structure and functions of the Center were planned and developed. Various academic disciplines and health care provider resources would be required to grapple with the complex problems of health care. It was also clear that many departments of the Faculty of Medicine and the University would welcome the opportunity to participate in health care research and development programs. The decision was made, therefore, that the Center should be interdisciplinary and interdepartmental.

The importance of community participation in the affairs of the Center was recognized from the beginning, and a number of mechanisms have been developed for involving community individuals and groups in planning and carrying out Center projects.

The Center has evolved in the direction of focusing on four kinds of problems: those having to do with ambulatory care in urban settings, such as upper Manhattan; health system problems relating to specific population groups, such as children, adolescents, the poor, and the elderly in upper Manhattan; the problems and possibilities of ambulatory care related to community hospitals in the United States; and more narrowly defined technological problems, such as expenditures on health care in New York City and queuing problems in ambulatory care.

The Presbyterian Hospital in the City of New York

The Presbyterian Hospital in the City of New York is the corporate title for and includes all of the individual units described below.

The Hospital has an overall capacity of 1,339 beds including bassinets. Its professional staff consists of 1,128 attending physicians, 382 residents and interns, and 111 visiting Fellows, whose nominations to the staff of the Hospital are made by the College of Physicians and Surgeons of Columbia University.

Students from the Faculty of Medicine of the College of Physicians and Surgeons of Columbia University, residents, interns, fellows, and students in various allied health programs use the Hospital's clinic facilities for their instruction. Some 150,000 patients a year are cared for in the hospitals, clinics

and doctors' offices of the Presbyterian Hospital which consists of the following units:

The Presbyterian Hospital

The Presbyterian Hospital, founded as a general hospital in 1868 by James Lenox, was originally located on the block bounded by Madison Avenue and Park Avenue between 70th and 71st Streets. In 1911 the Presbyterian Hospital and Columbia University's College of Physicians and Surgeons entered into an agreement for coordinating the care of the sick with the education and research programs of the College. This was followed by an alliance agreement in 1922 which led to the Medical Center complex which opened in the fall of 1928 at its present location in Washington Heights. In 1943 Babies Hospital and Neurological Institute were consolidated with Presbyterian Hospital. In 1945 New York Orthopaedic Hospital was consolidated with Presbyterian Hospital. Presbyterian Hospital is the single largest hospital unit, having inpatient facilities for the Services of Medicine, Surgery, Obstetrics and Gynecology, Urology, Otolaryngology, Dermatology and Orthopedic Surgery.

Babies Hospital

Babies Hospital was founded in 1887, and located at 657 Lexington Avenue (55th Street), and later moved to two houses at 56th Street and Lexington Avenue. In 1928 Babies Hospital moved to the Medical Center as a separate corporate unit which consolidated with Presbyterian Hospital in 1943. Babies Hospital, the Pediatric Unit, can accommodate 168 patients. A new fourteen story shell addition has been erected; ten floors have been completed. When completed the addition will provide modern patient areas, laboratories, classrooms and special care units.

Pediatric outpatient clinics are maintained in Vanderbilt Clinic. In addition to the general medical and surgical clinics, there are special clinics for children suffering from heart disease, tuberculosis, epilepsy, asthma and other diseases.

The Dana W. Atchley Pavilion

The Dana W. Atchley Pavilion, located on the corner of Fort Washington Avenue and 165th Street, provides facilities for 200 physicians to see ambulatory patients. The first six floors of this 14-story building were occupied in December, 1968. The remaining shell floors are for future development.

Harkness Pavilion

Harkness Pavilion provides in-hospital accommodations for 308 private and semiprivate patients.

The Edward S. Harkness Eye Institute

The Edward S. Harkness Eye Institute, opened in 1933, has a capacity of 52 beds and complete facilities for the medical-surgical treatment of patients with diseases of the eye. In October 1969, a new wing was opened, which provides research facilities and ophthalmologic outpatient facilities.

The Pauline A. Hartford Memorial Chapel

The Pauline A. Hartford Memorial Chapel, dedicated on June 25, 1952, has continuously served patients, professional staff and personnel of the Hospital since that time as a place of prayer and meditation. Made possible by a gift from Mr. John A. Hartford in honor of his wife, through The John A. Hartford Foundation, the Chapel provides an accessible center for the religious activities of the Medical Center. It is a place for both formal worship and private prayer by patients and their families, and by staff and personnel of all faiths. It is open 24 hours a day. The services of all faiths, and occasional organ and choral recitals are broadcast from the Chapel and may be heard by the patients over the Hospital's bedside broadcasting system.

The Neurological Institute

The Neurological Institute, founded in 1909, was one of the first nongovernmental hospitals in this country for the treatment of diseases of the nervous system. It was originally located on 67th Street and Lexington Avenue, moved to the Medical Center in 1929 and was consolidated with Presbyterian Hospital in 1943, making possible a broad basic program of teaching and research in neurology and the treatment of diseases of the nervous system. The Institute has a capacity of 237 beds, including 15 added in 1960 for psychiatric patients.

The New York Orthopaedic Hospital

The New York Orthopaedic Hospital was originally located at 420 East 59th Street, New York, N.Y. and was opened in 1866 largely because of the interest taken in the care of the crippled by Theodore Roosevelt, father of the President by the same name. In 1911 the first spinal fusion operation for Pott's Disease was performed by Dr. Russell A. Hibbs. Orthopaedic Hospital was consolidated with Presbyterian Hospital in 1945 and moved to the Medical Center in December 1950, where it has accommodations for 87 adults. It now occupies the 5th floor of the Presbyterian Hospital building and additional facilities in Harkness Pavilion.

Radiotherapy Center

The Radiotherapy Center, one of the largest

facilities for clinical research and x-ray treatment of cancer, was opened in 1966.

Sloane Hospital for Women

Sloane Hospital for Women was founded in 1886 and was originally located at 59th Street and Amsterdam Avenue. Sloane Hospital moved to the Medical Center in 1928 as a unit of the Presbyterian Hospital. It now occupies two floors of the Presbyterian Hospital and one floor of Harkness Pavilion, providing inpatient facilities for 117 patients and 48 bassinets.

The J. Bentley Squier Urological Clinic

Squier Urological Clinic occupies the 10th floor of Presbyterian Hospital, with additional facilities available in Harkness Pavilion and Babies Hospital for pediatric patients. It contains 46 beds.

Vanderbilt Clinic

Vanderbilt Clinic, originally presented to Columbia University by the Vanderbilt family in 1888, moved to the Medical Center in 1928 as part of the Presbyterian Hospital. It is now the primary outpatient facility for all units of Presbyterian Hospital. Last year there were 358,494 clinic visits. It is essentially a fully equipped outpatient clinic offering complete medical, surgical and speciality services. A modern emergency facility, staffed and equipped to deal with any medical or surgical emergency within the unit, was completed in 1973.

Other Patient Care Institutions Located at the Medical Center

The New York State Psychiatric Institute and Hospital, built and maintained by the State of New York, is a 174 bed hospital with provisions for the study and treatment of all types of psychiatric disorders.

The Washington Heights District Health Center was built and is maintained by the City of New York.

The Columbia-Presbyterian Medical Center Fund, Inc.

The Columbia-Presbyterian Medical Center Fund, Inc. is a non-profit corporation, formed in 1959, to receive and allocate funds for the Development Program of renewal and expansion of facilities at Columbia University's College of Physicians and Surgeons and The Presbyterian Hospital. Its officers are elected as a Joint Board of Trustees from the Boards of Trustees of the University and Hospital. Gifts and grants to the Fund may be made for specific projects, described in the Development Program literature, which is available on request, or they may be unrestricted, to be used by priority of need, as determined by the Joint Board of Trustees.

Report of the Chairmen of the Board

The Presbyterian Hospital in the City of New York



Report of the Chairmen of the Board of Trustees of The Presbyterian Hospital for 1978

Encouraging signs of a turnaround have been reflected in The Presbyterian Hospital's financial affairs in 1978, but a difficult road still lies ahead.

The financial struggle that gripped the Hospital during the past two years eased somewhat last year by virtue of several factors. These include substantial improvements in cost efficiency, successful appeals on reimbursement claims, a decrease in malpractice insurance costs and an increase in contributions.

Still, grave problems remain. To overcome them, we are committed to working toward greater efficiency and productivity, while maintaining restraints on Hospital spending. This is a credo all of us must accept.

Total operating revenue for 1978 was \$143,153,263, compared with \$125,951,041 in 1977. The loss from operations in 1978 was \$7,879,137, a significant reduction from the \$18,014,644 operating loss for 1977. Even more dramatic, the net loss for 1978 was \$883,852 as compared with a net loss of \$13,904,031 in 1977.

The factors contributing to the brightening financial picture include:

- Income increased by 13.7 percent while expenses rose only 4.9 percent. The expense figure is particularly noteworthy; it compares with an average cost increase of 8 percent among hospitals in New York State last year and with hospital expenses nationally that rose by an average of 13 percent.

- Successful Blue Cross appeals on reimbursements totaled \$9.1 million. This figure, among other things, reflects a reduction of \$2.5 million in occupancy penalties through decertification of 200 beds

and \$2.6 million in revenues related to various appeals in previous years that were settled in 1978.

- Unrestricted contributions totaled \$1,236,284 in 1978 compared with \$684,672 in the previous year.

The Hospital recorded 400,747 in-patient days in 1978 as compared with 411,540 in 1977. The decline was caused by a reduction in the average length of stay of patients. It has dropped from 11 days in 1975 to 9.46 days in 1978. This reduction is highly commendable and has provided substantial savings for patients and taxpayers alike. Our efforts along this line will continue. It is unfortunate that these efficiencies penalize the income of the Hospital in substantial amounts (\$4,000,000 in 1978). The Hospital is attempting to remedy this loss of income by increasing admissions—a difficult and sometimes painful procedure. It would seem appropriate for our legislators to supplement our efforts through the adoption of more reasonable reimbursement formulae.

Out-patient visits to Vanderbilt Clinic and the doctor's private offices totaled 611,093, up slightly from 609,182 in 1977. Approximately 58 percent of the patients seen at the Vanderbilt Clinic were covered by Medicaid or Medicare. Meanwhile, those patients with income levels too high to qualify for Medicaid—the so-called working poor—created a reimbursement shortfall and loss to the Hospital of \$5,621,000.

The fiscal crisis in ambulatory health care continues to exercise a harsh effect on the Hospital's vast clinic program. The state government's unrealistic

Medicaid outpatient reimbursement rate places an onerous financial burden on us. Presbyterian Hospital recorded a \$7,421,000 clinic loss this year. It is distressing to realize that, although we are fulfilling our role as a voluntary hospital and meeting the needs of our neighbors, the state and city has failed to provide adequate reimbursement. That dilemma is heightened for us because of the additional patient load assumed since the closing of Delafield Hospital by the City of New York in 1975.

We believe that the problem can be largely solved if the state would follow the example set by many other states and establish a State Health Services Commission. Such a mechanism has already been proposed by the Hospital Association of New York State and we support it. As an independent agency, it would be removed from the political pressures confronting regulatory agencies under the direct operation of government. The centralization of authority in this body could alleviate many of the bureaucratic problems presently hampering the health-care delivery system. Presbyterian Hospital would welcome the Commission since it would base reimbursement payments on budgeted costs and would do away with the unrealistic, rigid prospective reimbursement concept and build incentives for efficiency.

Budgeting System

As part of the continuing effort to control costs and expenses, the Hospital installed a new budgetary control and cost-center reporting system last year. It also engaged the accounting firm of Deloitte, Haskins & Sells to review its purchasing policies, procedures and practices. The objective of the budgeting system is to anticipate estimated revenues and expenses, and to take positive action before the start of each fiscal year and corrective measures throughout the budget year. In addition to being an excellent management process, we believe the new system will be a valuable education process in which the medical staff participates in the concepts and practices of budgeting.

Our Senior Vice President for Finance, M. James Peters, has described this participatory budget process as "a positive step forward by involving doctors, medical services and hospital departments in the creation of each year's overall Operations Plan."

Management Audit

Closely in line with the new budgeting system is the new management audit department formed last April. One of its functions is to gather information on and analyze staffing needs in different Hospital areas to achieve maximum efficiency. This new department is headed by P. David Lindsay, who joined us

on January 1 after holding a similar position for three years at Presbyterian-University Hospital in Pittsburgh.

Master Plan

Under the leadership of a Special Committee of the Board formed in mid-1977, the development of the long range plan for the Hospital has started. That effort was advanced with the guidance of two hospital planning consultant firms, Llewelyn-Davies Associates and Perkins & Will. Last year a significant step forward was taken with the establishment of the Office of Planning. It is headed by David L. Ginsberg, formerly a partner of Perkins & Will, who joined the Hospital staff, charged with organizing and coordinating the master plan. We are confident his appointment will contribute greatly to this vital undertaking. Mr. Ginsberg is coordinating master plan activities with the directors of service, department heads, administrators and community leaders. The project is in close collaboration with the Health Sciences Division of Columbia University.

Priority Projects Program

While the master plan will drastically re-shape Presbyterian Hospital in the years to come, a renovation program is an immediate goal. It is required to upgrade a portion of the Hospital's aging physical plant—constructed in 1928—to meet life safety regulations enacted long after its construction. The renovation plan calls for subdividing, refurbishing and air-conditioning the large wards and the facilities in Vanderbilt Clinic, Presbyterian Hospital and the Neurological Institute. The priority projects program, as it is known, will cost \$18 million.

The program aims at rendering care with greater privacy and dignity in modernized facilities.

The modification will also include completion of the unfinished "shell" floors in the new wing of Babies Hospital. The extra space will be needed to convert almost 600 beds in the older building from 14 to 16 bed wards to more private, dignified facilities. The new rooms will be available to all patients.

Another feature of the plan calls for a shift in certain specialty patient units from Vanderbilt Clinic to Atchley Pavilion. The renovation plan has received final approval from the executive committee of the Manhattan Health Systems Agency.

Community Involvement

Last year Presbyterian Hospital reaffirmed its commitment as an active partner in the community it has served with such distinction for more than 50 years. Dr. Felix E. Demartini, President of the Hos-

pital, made that declaration to community leaders last March at the public hearing conducted by the Health Systems Agency. He said at that time, "I pledge the Hospital's commitment to the continued pursuit of excellence in all levels of patient care, to remain in the community and to be an active member of the community."

To fulfill that promise, the Hospital is working closely with the community to establish a community advisory council with a focus on ambulatory care, reaffirm a standard of one-class medical care, expand its appointment system for visits to the various clinics, enhance multi-lingual capabilities in medical translation and set evening hours in the medical clinic.

Presbyterian Hospital also joined with other institutions in the Washington Heights-Inwood area to form a consortium. Its goals include enhancing economic development, attracting new industry and residents and upgrading the preception of the community in the eyes of other New Yorkers.

The Medi/Center 1 Joint Development Program

The end of 1978 brought the Fund for Medi/Center 1 to a total of \$101,691,607 in contributions to the capital objectives of the Hospital and University. This represents 76 percent of the total goal of \$133,750,000.

A notable milestone of the year was the achievement of the Doctor's Fund, which generously surpassed its five-year objective of \$2 million.

The Presbyterian Hospital's Board of Trustees welcomed as a new member, Dr. Raymond Vande Wiele (ex officio). The Board thanks Dr. Joseph A. Silverman for his services over the past years as a representative of the Practitioners' Society.

This institution was deprived of an outstanding leader with the untimely death of Dr. Daniel V. Kimberg. He served but a short time with distinction as Director of the Department of Medicine.

Dr. Thomas Q. Morris was appointed Acting Director of the Department of Medicine as the search committee deliberates for a permanent chairman and director.

Other losses were suffered with the passing of John E. Bierwirth, Gen. Lucius D. Clay and Cleo F. Craig. We also mourn the passing of Drs. John Caffey, Mary I. Crawford, Anthony N. Domonkos,

John P. Lambert, H. Houston Merritt, Carl Truman Nelson and John E. Scarff.

Last year saw the retirement of Mr. Richard N. Kerst, our former President from the Hospital and the Board of Trustees. We extend best wishes to Mr. Raymond C. Minicus, Vice President of Reimbursement, who left the Hospital to join St. Vincent's Hospital as its director of finance. Mr. Joel K. Van Wynen also left his position as Vice President of Legal Affairs to serve as coordinator of Medical Center Insurance Company, an off-shore insurance arrangement that we have joined with three other hospitals. Our best wishes are extended to him in his new assignment. We are pleased to welcome back to Presbyterian Hospital Martha Haber, who has rejoined us as Vice President of Nursing.

We would like to take this opportunity to thank the Professional and Administrative Staffs, Personnel, members of the Womens' Auxiliaries and our corps of Volunteers for their dedication and cooperation. In addition, we extend our sincere thanks to all who provided financial support during the year, and we respectfully bid continuance of their thoughtful and vital assistance.

Looking back, the year 1978 marked a turning point. We have met the challenge of this trying period. But other challenges remain in the years ahead. External forces in government and society are seeking to restrict our development by arbitrarily imposing mandatory cost limits on teaching hospitals. We see this trend as one that can impair our ability to deliver quality care and retard medical advances we have pioneered. We view with concern the thrust to decrease expenditures by decreasing size. Such a development would have a severe impact on the Hospital's ability to fulfill its health care mission. We intend to press our case before the nation's legislators before irreparable harm is done.

Thomas H. Choate

Thomas H. Choate
Chairman of the Board

John W. Brooks

John W. Brooks
Co-Chairman of the Board

Report of the President of the Medical Board

The Presbyterian Hospital in the City of New York



Report of the President of the Medical Board

The Presbyterian Hospital in the City of New York

The travail of our great cities is widely known and partially understood. Understanding is always a step toward cure. The great hospitals, uniformly based in areas of heavy population concentration, have shared in the problems created by urban decay, assimilation of new citizen groups and the bankruptcy of municipal government.

Presbyterian Hospital has, along with its sister academic institutions, suffered also from the recent governmental preoccupation with medical cost containment and novel medical care delivery techniques. Government has insisted on a myriad of agency and lay group involvement in hospital planning and administration. The hospital has become a public utility rather than a charitable and humane pediment of our society. The transition itself has been traumatic to those who grew up in a different tradition and assumed they were "healers" and not demeaned as mere "providers" of health care.

Presbyterian Hospital had first to recognize the immensity of its problems. Although saddled with a huge clinic load poorly reimbursed by governmental agencies and functioning in a 50 year old plant, it could not, in conscience, take measures to contract its responsibilities to the community. In making that decision, it reinforced its chartered moral mission.

In a crisis setting the Hospital Trustees moved to study the Hospital's options and the essentials for strengthening it to stand the financial pressures inherent in its situation, and also to prepare it for the future. They then proceeded to forge an administrative group charged with bringing the crippling deficits under

control and then initiate planning for an efficient and attractive hospital within a finite time.

Happily, the management team is in place and trying very hard to make the institution maximally useful to the patients and those who care for them. A great deal remains to be done in rebuilding the physical plant and bringing the supporting services to maximum efficiency. However, presently the institution comprehends its role better, and both Trustees and staff have committed themselves unequivocally to rehabilitating the physical and professional images of the Medical Center. There is evidence of this activity all around us daily.

We have all been impatient and at times very discouraged. Looking back at how far we have come from the crisis days toward creating a new and better patient care environment makes it easier to face the trials on the way.

Our Trustees deserve our deep thanks for taking on such an Herculean task and for their conviction that the effort is worthwhile. The quality of patient care has always been our Hospital's greatest concern and asset and is the ultimate responsibility of the professional staff. I am convinced it will prove that the Trustees made not only a courageous decision but a wise one.



Edward B. Schlesinger, M.D.
President, Medical Board

Health Insurance Coverage of the Elderly

James E. Poterba, Harvard University

The health insurance coverage of the elderly is a complex issue. It involves a variety of factors, including the type of insurance, the cost of insurance, and the availability of insurance. This paper will discuss the current state of health insurance coverage for the elderly and the challenges that face them.

One of the major challenges facing the elderly is the high cost of health insurance. Many elderly people are on fixed incomes, and the high cost of health insurance can be a significant burden. This is especially true for those who are not covered by Medicare, which is the primary health insurance program for the elderly.

Another challenge is the availability of health insurance. Many elderly people are not covered by any health insurance, either because they are not working or because they are not eligible for Medicare. This leaves them vulnerable to financial hardship if they become ill.

There are a number of ways to address these challenges. One is to increase the funding for Medicare, so that more elderly people can be covered. Another is to provide subsidies for the cost of health insurance for those who are not covered by Medicare.

Conclusion

Health insurance coverage of the elderly

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Annual Reports for 1978

Vice President for Health Sciences

Dean of the Faculty of Medicine

Dean of the Faculty of Dental and
Oral Surgery

Annual Report 1978

The Board of Directors of the Corporation has pleasure in presenting to the stockholders the following report for the year ended December 31, 1978.

The Corporation has achieved significant progress in the past year, particularly in the areas of research and development, and in the expansion of its operations.

The Corporation's financial performance for the year ended December 31, 1978, is summarized in the following table:

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Annual Report for 1978

Vice President for Health Sciences



Health Sciences Faculties
Columbia University in the City of New York

Report of the Vice President for Health Sciences

It is my honor to submit the sixth Annual Report of the Vice President for Health Sciences of Columbia University for the year ending December 31, 1978. As we enter the final year of this decade, the Columbia-Presbyterian Medical Center, like other academic health centers, is facing increasing challenges to the partnership which has existed between the Federal Government and the academic health centers since the late 1940's. This partnership represents a very important component of our country's health care "system." An academic health center is generally defined as a complex of a medical school and one or more other health professional schools of the university and their affiliated teaching hospital(s). The Columbia-Presbyterian Medical Center includes: the Health Sciences Faculties of the University (composed of the Faculty of Medicine, which includes the College of Physicians and Surgeons, School of Nursing, School of Public Health, Allied Health Programs and Continuing Education Programs; and the Faculty of Dental and Oral Surgery, which includes the Dental School, Dental Hygiene Program and Continuing Education Programs) and the Presbyterian Hospital which incorporates these units: Babies Hospital, the Dana W. Atchley Pavilion, Harkness Pavilion, the Edward S. Harkness Eye Institute, the Neurological Institute, the New York Orthopaedic Hospital, the Radiotherapy Center, Sloane Hospital for Women, the J. Bentley Squier Urological Clinic and Vanderbilt Clinic. The Health Sciences Faculties of Columbia University are affiliated, in addition to Presbyterian Hospital, with Harlem Hospital Center, St. Luke's Hospital Center, and Roosevelt Hospital, as well as Overlook, Mary Imogene Bassett and Helen Hayes Hospitals and the New York State Psychiatric Institute.

The Columbia-Presbyterian Medical Center was the first academic health center in the United States to bring together at one site University health profes-

sional schools and a voluntary hospital to provide the highest quality of patient services in a setting for health professional education and biomedical research. Today academic health centers continue to have these three missions in the health care system: education, research and patient care. The Government is in partnership with us in all three of these missions. This partnership is facing increasing problems owing, in part, to factors such as changing priorities, economic constraints and urban decay. To the extent that these problems threaten the effectiveness of this partnership they threaten our national capability to improve health care in this country.

There is no doubt that the changing expectations of the public with respect to academic health centers may not be perceived by all on the staffs of our centers. Nevertheless, while emphasis may be placed on changing expectations with respect to the challenge of primary health care or geriatric health care or the necessity to contain hospital costs or possible roles that the center must play in the development of national health insurance programs, the dimensions of the challenges facing our center and possible approaches to them can be understood only in the context of all of our missions.

The role of academic health centers in partnership with the Federal Government in the pursuit of new knowledge through research is supported largely by public funds. This federal policy reflects the conviction that biomedical research is essential for the improvement of the health of our people. While the government never made an explicit decision that academic health centers should be the primary site for the conduct of biomedical research, the fact is that the Columbia-Presbyterian Medical Center and other academic health centers are the primary sites for such research. These centers represent important resources in our society in the pursuit of new knowledge in the health care field. In this partnership the

Government makes commitments on an annual basis to support research. Centers must make long-term commitments to provide the staff and the physical facilities for this research.

In recent years, the centers have begun to experience hardships in this partnership as a consequence of several factors, among which are changing federal policies and priorities, commitments to faculty and facilities not relevant to these new priorities, and the constraints of limited funds. It has been particularly difficult to deal with the instability of funding for research programs, as priorities shift in federal commitments from one area of perceived need to another. The early '70s were marked by major new commitments to attack problems of cancer and cardiovascular diseases. During the past year, for example, emphasis on prevention of disease and research on behavioral disorders have received primary emphasis. These are extremely important problems. Unfortunately we cannot claim victory in the attack on cancer or cardiovascular diseases, and facilities and faculty whose talents are committed to these types of research programs cannot be redirected easily and effectively to research on behavioral problems or strategies for disease prevention.

In the area of education, it is, of course, not necessary to dwell on the unique role of centers such as ours as training sites for health professionals in this country. As a result of federal incentives, between 1955 and 1975 almost 40 new medical schools were begun and existing classes enlarged so that during this 20 year period there was a doubling in the number of entering students. Expansion of health professional training programs was not limited to the M.D. programs. In 1979, we are faced with pressures to limit many of these same programs. These pressures result, in part, from a perception that the problem is not providing an adequate number of physicians or other health professionals, but rather a maldistribution with respect to both specialty and geography. Responding to these types of challenges will require, in part, facilities different from those which exist in our medical center as well as new types of faculty and staff. At the present time, little if any federal funding exists to develop such new facilities or to increment our staff. Indeed, federal support for health professional education is being cut back. Here again the combination of changes in federal priorities coming at a time of decreasing federal funding makes it particularly difficult to respond appropriately and adequately to these public needs.

The Columbia-Presbyterian Medical Center faces particularly complex tasks as a provider of health services. Almost 30% of all visits made to hospitals by Americans seeking help for medical problems are

made to the Emergency Rooms or Out-Patient Clinics of teaching hospitals. For certain types of highly specialized and complex services these centers provide an even greater proportion of the services. During the past decade, fully one quarter of all academic health centers in this country have found themselves in the middle of inner cities, where they have become a major, if not the primary, factor in health care for the sick poor. Further, complex tertiary care and care for the sick poor frequently carry with them, in our setting, significant financial burdens, since the costs of such services are inadequately covered by reimbursing agencies. In this area, while the Center must continue moving to provide certain new or expanded commitments, we do so in an atmosphere where the containment of costs must be a primary consideration. There is no doubt that the partnership between the federal government and academic health centers in the coming years is going to place a very heavy emphasis on cost containment while it will continue to rely on centers for increased primary health care in our geographic area and continued excellence in the provision of complex or tertiary care for a much broader segment of our population.

The continued successful functioning of the partnership between the federal government and academic health centers must be a given for all who are concerned with improving the health of our people. The effectiveness of this partnership requires a process that assures greater stability in federal funding and introduces some flexibility in the use of the funds provided to the centers on the one hand, and on the other, the commitment of the Center to more appropriate planning and resource allocation to meet the challenges of our changing scene.

Faculty

This past year has been marked by a number of major faculty recruitments, by continued upgrading of our physical facilities and by initiation of certain new programs and selective expansion of established programs. Doctor Edward V. Zegarelli, after five years of distinguished service as Dean of the School of Dental and Oral Surgery, retired to Emeritus status. During Dr. Zegarelli's tenure, the School of Dental and Oral Surgery underwent a remarkable renaissance which included the strengthening of its academic programs, development of completely new, renovated facilities for the preclinical and clinical programs, development of a residency training program, and expansion of our outreach community dental programs. We were indeed fortunate in recruiting as Dr. Zegarelli's successor, Dean Allan J. Formicola, formerly Acting Dean and Professor of Periodontics at the New Jersey Dental School. Dr.

Formicola, in just six months as Dean, has already indicated important new directions in research, teaching and organization which augurs well for the future of our School of Dental and Oral Surgery.

Dr. Isidore Edelman was recruited to the Chairmanship of the Department of Biochemistry and became the first incumbent of the newly established Robert Wood Johnson Jr. Professorship in Biochemistry. Dr. Edelman, one of the country's most distinguished biophysicists, has initiated a vigorous program in recruitment of a number of junior and senior members of the department which represent very important additions to our faculty. Dr. John H. Bryant, DeLamar Professor and Director of the School of Public Health, has taken a leave of absence to assume the post as Assistant Secretary of Health for International Affairs in the Department of Health, Education and Welfare. Dr. Bernard D. Challenor has assumed the position as Acting Dean of the School of Public Health.

The year was marked by the tragic and sudden death of Dr. Daniel V. Kimberg, Samuel Bard Professor and Chairman of the Department of Medicine. In the less than two years in which he was the incum-

bent in this critical post in our Faculties, Dr. Kimberg achieved more than all but a very few who have had the opportunity to serve our University for many more years than he.

Among the several major academic initiatives of the past year, reviewed in detail in the reports of the Deans of the Faculty of Medicine and the Faculty of Dental and Oral Surgery and the Departments and Institutes, are the expansion of the programs in medical ethics and society under the leadership of Dr. Bernard Schoenberg and funded by grants from the Mallinckrodt Foundation; the recognition by the National Cancer Institute of Columbia's Cancer Center/Institute of Cancer Research as one of 21 designated comprehensive cancer centers in this country, and the continued development of effective educational and training programs in primary health care in medicine, pediatrics and obstetrics and gynecology under the leadership of Drs. Michael Stewart, Nicholas Cunningham and Allan Rosenfield respectively.

An outstanding public event of the past year was the academic convocation for the awarding of the honorary degree of Doctor of Laws to Dr. Armand

TABLE I
DEGREE CANDIDATES IN THE HEALTH SCIENCES

		<i>Academic Year</i>			
		<i>1970-71</i>	<i>1972-73</i>	<i>1974-75</i>	<i>1977-78</i>
FACULTY OF MEDICINE					
<i>School/Department</i>	<i>Degree Program</i>				
Medicine	Doctor	543	573	580	593
	Master	12	19	28	30
Nursing	Bachelor	265	289	363	413
	Master	29	29	28	66
Occupational Therapy	Bachelor	27	24	27	2
	Master	31	30	34	63
Physical Therapy	Bachelor	20	19	21	0
	Certificate	25	26	30	52
Public Health	Doctor	9	13	21	54
	Master	121	127	155	271
Psychoanalytic Clinic	Certificate	41	43	37	33
	TOTAL:	1,123	1,192	1,324	1,577
FACULTY OF DENTAL AND ORAL SURGERY					
Dental and Oral Surgery	Doctor	181	184	198	221
	Postgraduate	57	52	42	29
Dental Hygiene	Bachelor	38	57	69	65
	Master	15	25	23	18
	TOTAL:	291	318	332	333
GRADUATE FACULTIES					
	Doctor		117	77	99
	Master	106	32	88	59
	TOTAL:	106	149	165	158
	GRAND TOTAL OF DEGREE CANDIDATES:	1,520	1,659	1,821	2,068

TABLE 2
POSTGRADUATE—CONTINUING EDUCATION COURSES
HEALTH SCIENCES FACULTIES

	1972-1973		1974-1975		1977-1978	
	# of Courses	Enroll- ment	# of Courses	Enroll- ment	# of Courses	Enroll- ment
<i>Faculty of Medicine</i>						
Medicine	36	1,781	39	2,714	68	4,052
Public Health	19	616	8	277	10	221
TOTAL:	55	2,397	47	2,991	78	4,273
<i>Faculty of Dental and Oral Surgery</i>	—	—	22	396	17	626
TOTAL:	55	2,397	69	3,387	95	4,899

Hammer, P&S '21. The degree was awarded in recognition of Dr. Hammer's contributions to international relations, the arts, and biomedical sciences. Prior to the convocation, Dr. Hammer and President William McGill unveiled the naming plaque of the Julius and Armand Hammer Health Sciences Center, in honor of Dr. Hammer and his father, Julius Hammer, P&S '02.

Students and Faculty

The Health Sciences Faculties provide curricula in fourteen degree granting, two certificate and numerous post-doctorate and continuing education programs (Table 1). During 1978, post graduate and continuing education programs continued to grow in an impressive manner. A new office of continuing education has been established to coordinate and administer these programs for several schools of the Health Sciences Faculties. Dr. Elizabeth Gerst has been named Director of this office and oversees the whole range of continuing education courses in the Health Sciences Faculties (Table 2).

In addition to the degree granting programs and the post-graduate and continuing education programs, our faculties have teaching responsibilities for over 1800 house officers and clinical post-doctorate fellows in our 8 affiliated hospitals (Table 3). The number of members of our faculties increased somewhat during the past year. These increases reflect primarily appointments to the part-time clinical faculties. The number of full-time members of the faculty of medicine decreased, despite the increases in the number of health professionals in our educational program (Table 4).

Affiliated Hospitals

The Health Sciences Faculties are unique among the faculties of this University in having as an integral part of their academic mission a requirement for patient service settings for the teaching of the students in our clinical programs. The clinical programs include our courses for the M.D., D.D.S., nursing and several of the public health degrees and for the degrees and certificate granting programs in occupational therapy and physical therapy and many of our continuing education programs. Columbia University owns only one health care delivery site, the Dental Clinics, which are located in the School of Dental and Oral Surgery. All other settings for our clinical educational and training curricula must be provided through our agreements with our eight affiliated teaching hospitals (Table 5).

General Revenues and Expenditures

The general revenues and expenditures for the Health Sciences Faculties for the years ending 1974,

TABLE 3

HOUSE STAFF/HEALTH SCIENCES FACILITIES

	1978
Residents	1,106
Trainees	382
Fellows	221
Visiting Fellows	136

TABLE 4

NUMBERS OF MEMBERS OF THE FACULTIES OF THE HEALTH SCIENCES

	<u>1970-71</u>	<u>1972-73</u>	<u>1974-75</u>	<u>1977-78</u>
<i>Faculty of Medicine</i>				
Full-Time	759	821	775	747
Part-Time	1,235	1,461	1,669	1,907
<i>Faculty of Dental and Oral Surgery</i>				
Full-Time	44	35	28	36
Part-Time	222	239	261	349
Total Full-Time	803	856	803	783
Total Part-Time	1,457	1,700	1,930	2,256
TOTAL:	<u>2,260</u>	<u>2,556</u>	<u>2,733</u>	<u>3,039</u>

through 1978 are presented in a summary fashion in Table 6. 1978 again represented a record level of both revenue and expenditure for the Health Sciences Faculties. For the first time in the history of our Health Sciences Faculties, revenues exceeded \$100 million. The Health Sciences Faculties continued to maintain a balanced budget. Despite reordering of priorities and cutbacks in several programs, the Health Sciences Faculties have again competed successfully for a record level of government grants and contracts for research and training. (Table 6). The success of the Health Sciences Faculties in attracting this external funding on a national competitive basis is, of course, a tribute to our faculty and its programs.

Capital Campaign

In 1978 we marked the completion of the fifth year of our joint capital campaign with the Presbyterian Hospital. Major gifts from governments, foundations, friends and alumni have made possible the construction of the new Julius and Armand Hammer Health Sciences Center and Augustus Long Health Sciences Library, the now more than 50% comple-

tion of the extensive renovation program for the P&S Building, the complete renovation of the facilities of the School of Dental and Oral Surgery, the School of Public Health and for our Occupational Therapy and Physical Therapy Programs. The capital campaign,

TABLE 6

REVENUES AND EXPENDITURES

Health Sciences Faculties
Columbia University
Fiscal Year Ending June 30, 1978
(In Thousands)

Revenues

General Income Revenues	
(Tuition & Fees,	
Indirect Costs,	
N.Y. State Aid)	\$ 18,835
Restricted Revenues	84,507
Total Revenues	\$103,342

Expenditures

General Income Expenditures	
Academic	\$ 6,873
Libraries	557
Buildings and Grounds (direct)	7,106
Endowments, Gifts &	
Receipts for Special	
Purposes	35,422
Government Grants &	
Contracts	
Research & Training	33,385
Service	15,000
Total Expenditures	\$ 98,343
Available for Central	
Services	4,999

TABLE 5

HOSPITALS AFFILIATED WITH
COLUMBIA UNIVERSITY

<u>Institution</u>	<u>Type</u>	<u>Bed Capacity</u>
Presbyterian Hospital	Voluntary	1,339
Harlem Hospital Center	City	1,100
St. Luke's Hospital Center	Voluntary	773
Roosevelt Hospital	Voluntary	595
Overlook Hospital	Voluntary	540
Mary Imogene Bassett Hospital	Voluntary	183
New York State Psychiatric Institute	State	180
Helen Hayes Hospital	State	150

TABLE 7

CAPITAL CAMPAIGN
HEALTH SCIENCES FACULTIES
PLEDGES AND RECEIPTS

(As of June 30, 1978)

<u>Project</u>	<u>Total</u>
Hammer Health Sciences Center—	
Augustus Long Library	
Construction .. 28,303,815	
Site Acquisition <u>1,993,333</u>	\$30,297,148
P & S Renovation: School of	
Dental & Oral Surgery	10,195,775
Endowment	20,816,293
Special Funds	1,286,747
Unrestricted	<u>2,759,490</u>
	<u>\$65,355,453</u>

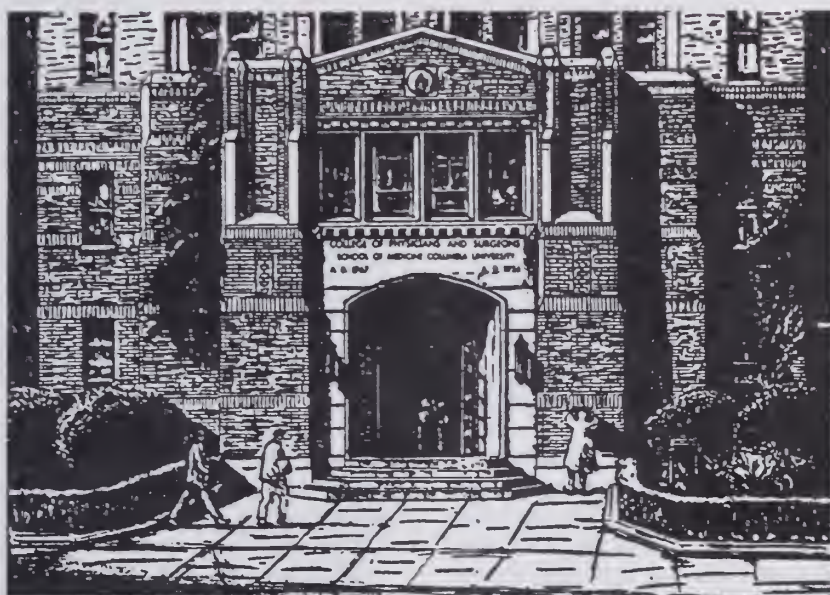
which had as its objective \$133.5 million for the Columbia Presbyterian Medical Center, reached a total of over \$102 million at the close of 1978. Of this sum, as of December 31, 1978 the funds generated for University projects were close to \$70 million. (Table 7) This accomplishment, of which we are all proud, is in no small part owing to the dedicated and effective leadership of our Trustees, in particular, Mr. Harold Helm, Trustee of the Presbyterian Hospital and Chairman of the drive and Mr. Robert D. Lilley, Trustee of Columbia University and Co-Chairman of the drive. Our continuing efforts are directed towards the remaining priorities for facility renovation which includes completion of the renovation of the P&S building and much-needed renovation of student housing facilities.

Paul A. Marks

Paul A. Marks, M.D.
Vice President
for Health Sciences

Annual Report for 1978

Dean of the Faculty of Medicine



College of Physicians and Surgeons
Columbia University in the City of New York

Report of the Dean of the Faculty of Medicine

The events and goals of the past year have in many ways represented a summing up of trends over the last five years and for that reason they should perhaps be enumerated together with some of the more powerful natural forces shaping medical education and research.

A growing emphasis on continuing medical education has expanded the responsibilities of every department for graduate and postgraduate instruction. This has become evident not only by the increased number of formal courses and symposia but by the greater number of regular guest lectureships and special programs offered at every level of professional training.

An increasing public concern with the responsiveness of medicine to financial, ethical and sociocultural issues has prompted a greater interest by governmental and other agencies in admissions policies, curriculum revision, research funding and standards of medical practice. For our part we have made substantial efforts to expand our self-monitoring and self-regulating activities to insure that our position remains one of leadership in areas of public interest rather than compliance in response to public pressure.

We have reviewed procedures for approval of research protocols involving human subjects, have examined our admissions requirements to be sure that our recruitment needs are consistent with the needs, goals and richly varied backgrounds of our applicants, and have carefully considered our priorities and educational strengths and weaknesses in many areas, including primary care medicine and medical ethics and values.

We have been firm in our resolve to impart to our students a medical education which will enable them to participate in and adapt to a newly evolving relationship between medicine and society. For our faculty members we have maintained a stable and cooperative system for intellectual and financial support.

A number of faculty members were appointed to named professorships in 1978. Dr. Stanley Fahn became the H. Houston Merritt Professor of Neurology; Dr. Alexander Garcia was named the Frank Stinchfield Professor of Orthopedic Surgery; Dr. Isidore S. Edelman assumed his position as Chairman of the Department of Biochemistry and was named the Robert Wood Johnson, Jr. Professor of Biochemistry; Wilbur H. Sawyer became the Pfeiffer Professor of Pharmacology, Dr. Mervyn Susser became the first Gertrude Sergievsky Professor of Epidemiology, and in a special tribute to Dr. Albert A. Anderson, Director of Rehabilitation Medicine at Harlem Hospital, it was announced that the rehabilitation wing of the hospital would be named for him and that Dr. Anderson would become the first A. David Gurewitsch Professor of Rehabilitation Medicine.

Three College of Physicians and Surgeons faculty members were awarded Irma T. Hirsch Career Scientist Awards for five year periods beginning in 1979. The winners of these prestigious grants were: Dr. Qais Al-Awqati, Associate Professor of Medicine and Physiology, for his work on hydrogen transport in epithelia; Dr. Claude P.J. Ghez, Associate Professor of Neurology and Physiology, for research

on neuronal mechanisms of voluntary movement; and Dr. Alan R. Tall, Assistant Professor of Medicine, for work on the formation of high density lipoprotein from chylomicrons.

In contrast to the recognition of leadership and achievement which these designations signify, the college must record its very special and profound sense of loss at the sudden deaths of two members of the P & S community. The death of fourth year medical student Michael Aranow, an exemplary student, son of Dr. Henry Aranow, and friend to many, and that of Dr. Daniel Kimberg, Chairman of the Department of Medicine, newly appointed Samuel Bard Professor of Medicine, and generous and esteemed advisor in the affairs of the medical school, shocked and deeply saddened us all. Dr. Thomas Q. Morris has agreed to serve as Acting Chairman of the Department of Medicine until a new chairman can be appointed.

The Convocation address at Commencement ceremonies for the class of 1978 was given by Dr. Harold Neu, Professor of Medicine and of Pharmacology. The Distinguished Service Award, P & S' highest honor, was given to Dr. Frank Stinchfield, Professor and Chairman Emeritus of Orthopedic Surgery; the Joseph Mather Smith Prize for distinguished research was awarded to Dr. Robert W. Berliner of the Class of 1939, and currently Dean and Professor of Physiology and Medicine at Yale University School of Medicine; and the Dean's Award for Outstanding Contributions to Teaching was given to Dr. Eric R. Kandel, Professor of Physiology and Psychiatry, for his work in the study of neurobiology and behavior.

Prizes given to members of the graduating class included:

The Alumni Association Award, Dr. Peter Albertsen and Dr. Calvin Warshavsky; Doctor Harry S. Altman Award, Dr. Leslie L. Davidson; Herbert J. Bartelstone Award, Dr. Jane E. Salmon; Alvin Behrens Memorial Fund Award, Dr. Dean E. Stetz; Coakley Memorial Prize, Dr. Bo Gyi; Titus Munson Coan Prize, Dr. Jane E. Salmon; Thomas F. Cook Prize, Dr. Barbara A. Winkler; Frederick P. Gay Memorial Award, Dr. Darcy Jeanne Hansen; Jane-way Prize, Dr. Peter M. Hoagland; The Kaufman Prize, Dr. Barbara S. Koppel and Dr. Carolyn A. Schanck; Doctor Harold Lamport Biomedical Research Prize, Dr. Jonathan Newmark; The Robert F. Loeb Award, Dr. Peter M. Hoagland; Edith and Denton McKane Memorial Award, Dr. Calvin R. Warshavsky; Doctor Harold Lee Meierhof Memorial Prize, Dr. Jory G. Magidson; Joseph Garrison Parker Award, Dr. Elynne B. Margulis; The Sandoz Award, Drs. Julian L. Allen, and Cheryl S. Hutt;

The Helen M. Sciarra Prize, Dr. Ross A. Reife; Doctor Harold B. Stevelman Prize, Dr. Charles M. Blatt; Upjohn Achievement Award, Dr. William P. Peters; Urology Prizes, Drs. Peter M. Hoagland, William P. Peters, John V. White and Henry A. Young; Doctor William Perry Watson Award, Drs. Leslie L. Davidson and Lynn D. Schackman; Doctor William Raynor Watson Memorial Award, Dr. Ellen L. Hollander; Doctor Allen O. Whipple Memorial Prize, Dr. Steven T. Ruby; Sigmund L. Wilens Prize, Drs. Nancy P. Paetzold-April and Peter M. Hoagland.

Dean's Day for Medical Student Research was held on May 3, 1978 and included the presentation of five outstanding research papers. They were: "*In Vivo* Evidence that Estrogen Acts Directly on the Pituitary to Increase Prolactin Secretion," by Allen M. Dennison '80; "Development of a Phage-Plaque Assay for the Detection and Quantitation of hCG," by David M. Edinburgh '79; "Biogenic Amines and cAMP: A Possible Role in Arousal States," by David E. Mandelbaum '80; "Evidence in Support of a Recombinational Mechanism for Viral Transformation: Illegitimate Recombination in Adenovirus," by Matthew D. Paul '80; and "Intragenic Spacers Interrupt the Ovalbumin Gene," by Ruth S. Weinstock '80. The Alfred E. Steiner Award, given by Harcourt, Brace, Jovanovich, was shared by the five participants, although Ms. Weinstock was particularly cited for the excellence of her research work.

Dr. Robert S. Krooth, Professor and Chairman of the Department of Human Genetics and Development, delivered the address at opening exercises of the College on September 7. He spoke on "The Human Predicament," that is, the discrepancy between the extraordinary rate of cultural and environmental change and our very slow rate of physical evolution, a discrepancy with important implications for preventive medicine.

The Carl Truman Nelson Memorial Lectureship was established in 1978 through an endowment fund supported by contributions from Dr. Nelson's many friends, colleagues and former residents. This annual lectureship will bring a dermatologist of international renown to Columbia to promote dermatological education at the Medical Center.

The lengthening roster of visiting lecturers at P & S has continued to represent a cross section of the most distinguished speakers from this country and abroad. The 24th Cartwright Lecture was given in 1978 by Dr. John R. Hogness, President of the University of Washington in Seattle, on "A Comprehensive View of Medical Malpractice;" The David Seegal/Alpha Omega Alpha Lecture was given by Dr. Samuel O. Thier, Professor and Chairman of the Department of

Internal Medicine at the Yale University School of Medicine, on "Potassium Homeostasis;" Dr. Edwin Shneidman, Professor of Thanatology, Neuro-Psychiatric Institute of the University of California at Los Angeles, gave the Alexander Ming Fisher Lecture on "Death and the Aged;" and among the special lectures sponsored by individual departments was that of Dr. James F. Childress, Joseph P. Kennedy, Sr., Professor of Christian Ethics at the Kennedy Institute Center for Bioethics at Georgetown University and Visiting Professor in the Department of Rehabilitation Medicine at P & S, who spoke on "Liberty, Paternalism and Health Care."

The Samuel L. Rudin Visiting Professors for 1978-79 were:

Dr. Rozella Schlotfeldt, Professor of Nursing at Case Western Reserve University; Dr. Leo Sachs, Otto Meyerhof Professor of Biology, Head of the Department of Genetics and Dean of the Faculty of Biology, Weizmann Institute of Science, Israel; Dr. Paul Lacy, Mallinckrodt Professor of Pathology, Washington University, St. Louis; Dr. Charles Sriver, Professor of Pediatrics at McGill University, Canada; and Dr. Efraim Racker, Professor of Biochemistry, Molecular and Cell Biology, Cornell University.

From June 9 through 11, the third P & S Biomedical Sciences Symposium was held at Arden House. The topic, "Cells of Immunoglobulin Synthesis," was discussed by a distinguished group of speakers and participants. In addition, volume II of the symposium proceedings, covering the meeting in 1977 on "Neuronal Information Transfer," was published.

The College reports with great sorrow the following deaths:

Donald R. Hirsch, Associate in Clinical Neurology and Associate Neurologist, Presbyterian Hospital, on September 22, 1977.

Jack Sheps, Associate Clinical Professor of Psychiatry and Assistant pediatrician, Harlem Hospital, on November 9, 1977.

Albert J. Beckmann, Adjunct Professor of Public Health Practice, on November 19, 1977.

Morrell Goldberg, Lecturer in Public Health, on December 5, 1977.

Alvan L. Barach, Clinical Professor of Medicine, retired, and Consultant, Presbyterian Hospital, on December 13, 1977.

Howard B. Shookhoff, Adjunct Professor of Tropical Medicine, on December 27, 1977.

Clement C. Clay, Professor Emeritus of Administrative Medicine in Public Health, on January 16, 1978.

Nathan Lefkowitz, Assistant Professor of Public Health Education, on January 26, 1978.

Gilbert P. Smith, Consultant, Presbyterian Hospital, on January 5, 1978.

Carl T. Nelson, Professor Emeritus of Dermatology and Consultant, Presbyterian Hospital, on March 16, 1978.

Thomas P. Ashford, Assistant Clinical Professor of Surgery, May 15, 1978.

John P. Lambert, Clinical Professor of Psychiatry, Retired, and Consultant, Presbyterian Hospital, on July 10, 1978.

John E. Scarff, Professor Emeritus of Clinical Neurosurgery and Consultant, Presbyterian Hospital, on August 8, 1978.

John Coffey, Professor Emeritus of Radiology and Consultant, Presbyterian Hospital, on September 1, 1978.

Daniel F. Kimberg, Samuel Bard Professor of Medicine, Chairman of the Department, and Director of the Medical Service, Presbyterian Hospital, on November 26, 1978.

The registration of the School of Medicine in September, 1978, was as follows:

First Year	150
Second Year	150
Third Year	150
Fourth Year	145

In the School of Public Health the registration at the same time was as follows:

D.P.H.	57
M.P.H.	246
M.S. (Biostatistics)	5
M.S. (Epidemiology)	4
Special Students	29
M.P.H./M.B.A. (Joint Program)	33
M.P.H./M.S. U.P. (Joint Program)	4
M.P.H./M.S. Social Work (Joint Program)	20
M.P.H./D.D.S. (Joint Program)	1

In the School of Nursing, enrollment was as follows:

B.S.	401
M.S. (Adult Nursing)	23
M.S. (Gerontological Nursing)	2
M.S. (Maternity Nursing)	31
M.S. (Pediatric Nursing—Ambulatory)	22
M.S. (Pediatric Nursing—Perinatal)	17
M.S. (Psychiatry and Community Mental Health—Adult)	13
M.S. (Psychiatry and Community Mental Health—Child)	10

In all, 63 students were registered in the course for Occupational Therapists in September, 1978; 46 in the Course for Physical Therapists; 17 in the Institute of Human Nutrition; 34 in the Psychoanalytic Clinic, and 4 in the Master's Program for Clinical Microbi-

ology. There was one candidate in the Doctor of Medical Science program.

The following degrees were conferred:

M.D.	148
M.P.H.	99
D.P.H.	8
M.S. (Nursing, Occupational Therapy, Public Health, Clinical Microbiology, Nutrition)	66
B.S. (Nursing, Occupational Therapy, Physical Therapy)	175

The following certificates were awarded:

Certificate in Physical Therapy	54
Certificate in Psychoanalysis	8

Curriculum

A significant educational accomplishment during the year was the implementation of major revisions in the first and second year curricula and the completion of review and planning of revisions for the third and fourth year. The third-and-fourth year subcommittee was co-chaired by Dr. Thomas Q. Morris, chairman of the curriculum committee, and Dr. Harold Dick. After initial discussions with all of the chairman of the Clinical Departments, a small working group reviewed the quality of the learning experience throughout the clinical curriculum. Surprisingly, there was not great sentiment for change among either the faculty or the students. There were, however, a number of suggested revisions aimed at refining and heightening the quality of student experience. Prominent among these were the development of a perinatology rotation during the Obstetrics and Gynecology/Pediatrics quarter and institution of an Ambulatory Care/Public Health requirement during the elective curriculum. The latter experience is still in the planning stage, but is viewed as one which can be taken at many of the affiliated hospitals. In addition, Dermatology, Ophthalmology, and Otolaryngology clerkships were reorganized in order to provide the students with a more meaningful clinical exposure. These recommendations, all of which were approved by the Faculty Council, are to be implemented at the third year level during the 1979-1980 academic year. The Curriculum Committee will monitor these changes closely in order to evaluate critically the nature of the learning experience for each student.

Implementation of the new first year curriculum proceeded successfully. A review committee, chaired by Dr. Mero Nocenti, considered both student and faculty responses to the new teaching program. Additional refinements are anticipated during

the 1979-1980 academic year. The second year curriculum was organized in a transitional fashion in anticipation of the new curriculum beginning in 1979-1980. New facets introduced during the past year included course material directed at stressing the influence of external regulation on the delivery of medical care. This effort was highlighted by Professor Eli Ginzberg, Director of the Conservation of Human Resources at Columbia University, and the A. Barton Hepburn Professor of Economics, who delivered a course on "Medicine and Society". In addition, Introduction to the Patient, the basic course in history taking and physical diagnosis, was for the first time taught largely during a block experience in the month of May by the combined faculties of not only the Departments of Medicine and Psychiatry, but almost every other clinical service. The initial response from the students was most favorable. With full implementation of the new curriculum in 1979-1980, correlation between Abnormal Human Biology and the basic course in Systemic Pathology will be possible. In addition, under the umbrella of Introduction to the Practice of Medicine, case oriented discussions of Ethics and Values will be introduced into the second year curriculum. Coordination of these efforts is under the direction of Professor Eric Marcus. Finally, many students were able to take advantage of elective opportunities during the first and second year. The Department of Anesthesiology provided meaningful experience in Cardiopulmonary Resuscitation. The greatest success, however, was provided by an introductory course in medical Spanish. This effort, which was directed by Professor Gabriela Mora of the Department of Spanish at Columbia University, was completed by more than 50 students of the second year class. The curriculum committee is deeply indebted to Dean Tapley for making this experience possible.

Throughout the 1978-1979 year, the committee was chaired by Dr. Thomas Q. Morris who was ably assisted by the Planning Committee comprised of Drs. Mero Nocenti, Norman Kahn, Eric Marcus, and Harold Dick. Mr. Ralph Boucher, a member of the fourth year class, worked ably with this group. Of special note on the working group for the third and fourth year curriculum were the contributions of Ms. Lisa DeAngelis and Mr. Paul Dolinsky, both of whom worked tirelessly to provide accurate information to the committee. Dr. Lester Geller and Dr. Mitchell Schorow continued to direct the student assessment of the learning environment with precision and expertise. The Elective Subcommittee was chaired by Dr. Peter Puchner. Implementation of this program was expertly directed by Dr. Ann S. Peterson, Associate Dean for Student Affairs. The Cur-

riculum Committee recognizes her major contribution to the success of the curriculum, and notes that it will sorely miss her expertise during her sabbatical leave.

Finally, success of all of the efforts of the Curriculum Committee was made possible by the expert assistance of Mrs. Flora Atkins, Administrative Assistant to the committee. The committee was also most fortunate to have the enthusiastic and expert assistance of Mrs. Sharon Kellner who effectively and accurately provided both faculty and students with a wealth of technical services. The committee greatly appreciates the enthusiastic help of these most valuable members of the staff.

Admissions

The national trend in medical admissions as a function of time became a dramatically reversed one in the 1978-79 admissions year. From a previous pattern of continual annual increases in the total numbers of applicants (for example, from a total of 24,987 in 1970-71 to 42,624 in the record year of 1974-75), there had been a slow decline in the totals. The decrement from 1977-78 to 1978-79 has been, however, an abrupt one nationally, marked by a decline of some 4,000 applicants.

The experience at P&S has differed from this national trend in that, by receiving 4,640 applications from the residents of the fifty states and seven foreign countries, our applicant total was slightly larger in 1978-79 than it had been in the previous year. The actual numbers of total applicants to P&S has only limited significance, however, for our Committee on Admissions. For a number of years the Committee has devoted the bulk of its time and effort to the evaluation of the one thousand or so highly qualified applicants that we have continued to receive.

The entering class of September, 1978 contains 110 men and 38 women. From the 59 sons and daughters of P&S alumni who applied to us for admission, the Committee authorized offers of admission for 17 (or 30.5 per cent) of them, and 9 of them have matriculated at P&S. The class contains the residents of 17 states. The New York law that had required us to have a set percentage of state residents in the entering class if we were to be eligible for state financial aid, was to prevail initially only for the years of 1977 and 1978; last year the legislature made this "temporary" legislation permanent. For the foreseeable future, our entering classes should be made up of 70 per cent state residents at the minimum; for each out-of-state resident enrolled in excess of the permissible 30 per cent, we lose state capitation assistance for that individual for the succeeding four years. As this development comes at a time when the

White House is attempting to abolish educational subsidies for medical students, the Committee finds itself constrained in its attempts to achieve the traditional geographical diversity of P&S classes.

Graduate and Postgraduate Medicine

Graduate and postgraduate education at the College of Physicians and Surgeons is under the direction of José M. Ferrer, M. D., Associate Dean for Postgraduate Education. Dr. Ferrer has responsibility for the residency training programs, traineeships for fellows, Master of Science and Doctor of Medical Science degree programs, certificate programs, and programs in continuing education which are conducted at CPMC and affiliated hospitals and at community hospitals.

Nationwide continuing medical education continues to grow in significance and in the number of offerings. Currently 24 states have enacted legislation or created regulations requiring documentation of participation of physicians in continuing medical educational activities for the reregistration of the license to practice medicine. In addition a number of medical specialty societies and state medical societies, including the Medical Society of the State of New York, have established continuing medical educational requirements for renewal of membership.

In response to this steadily increasing need for continuing educational offerings of high calibre, in April the College of Physicians and Surgeons established the Center for Continuing Education in the Health Sciences under the direction of Dr. Elizabeth C. Gerst, formerly Assistant Professor of Physiology. The Continuing Education Center is functioning to expand the variety and number of approved activities and to consolidate continuing educational activities at CPMC and other affiliated hospitals. In addition to administering the postgraduate courses and activities for the School of Medicine, as of September, the Continuing Education Center assumed administrative responsibilities for continuing educational programs of the School of Nursing, School of Public Health and the Division of Allied Health. A new and burgeoning responsibility of the Center is the accurate recording, filing and reporting of continuing educational credits for physicians, nurses, public health personnel, and physical and occupational therapists, so that the varying requirements of states and societies can be met.

During 1978, the School of Medicine offered 71 short-term post-graduate courses which were given by 15 departments of the college. These courses were attended by 4,442 physicians, of whom 2,691 were paid registrants, 533 were lecturers in the courses,

and 1,214 were audit students from the attending and house staffs of our affiliated hospitals, i.e., Harlem, Helen Hayes, Mary Imogene Bassett, Overlook, Presbyterian, Psychiatric Institute, Roosevelt and St. Luke's Hospitals. Although the majority of courses were given at CPMC, several were held at our affiliated institutions. Physicians attending the courses came from virtually every state of the union, including Hawaii, every Canadian province, Puerto Rico, Jamaica, and from countries as far away as England, Holland, Switzerland, the Philippines and Australia. Two P&S alumni took advantage of a special program called "Practical Clinical Electives" and spent a week at CPMC in the Departments of Radiology and Anesthesiology, respectively.

The postgraduate medicine courses are primarily clinical in content, designed to refresh and update the knowledge of general practitioners as well as of those who desire training and skills in various specialties. As an institution accredited by the Liaison Committee on Continuing Medical Education, the College of Physicians and Surgeons has certified that these courses meet the definition of a planned program of CME and thus qualify for credits in Category 1 of the A.M.A.'s Physician's Recognition Award. In addition to the 71 postgraduate courses, some 60 other activities such as weekly grand rounds, departmental conferences and lecture series at CPMC and affiliates, have been approved for credit in Category 1. Accurate attendance records are kept and credits reported to the Medical Society of the State of New York for all approved activities.

The Continuing Education Center also registered 132 participants and 53 auditors and lecturers for four courses in nursing, allied health and public health. An increase in these offerings is anticipated for the coming year.

A new program of continuing medical education for community hospitals was instituted in 1976. In

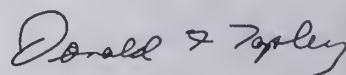
consultation with each hospital, a program of lectures, seminars or symposia is planned to meet the needs of each individual hospital's staff of health professionals. In 1978, 36 lectures were given at nine community hospitals located in Connecticut, New Jersey and New York. These lectures were given by 32 members of the Faculty representing the Departments of Medicine, Surgery, Obstetrics-Gynecology, Urology, Psychiatry, Dermatology, Pathology, Radiology, Preventive Medicine and the Cancer Institute. Attendance records for each of these conferences are kept and the credits reported.

The Continuing Education Center is involved also in the preparation and development of educational materials which meet the criteria for Category 1. These are materials intended for self-study such as audiotapes, videotapes, medical monographs, journals and television programs. In June, 2,717 physicians in 26 cities registered for a three-hour closed-circuit television program on depression that was sponsored by P&S.

Emphasis during the coming year will be on needs assessment and evaluation of offerings. Attempts will be made to determine the specific needs of the practicing physician in terms of continuing education and to evaluate the impact on the care of patients by the physicians who participate in our courses and activities.

The P&S Graduate Medical Education program continues at its usual high level with 1,106 residents trained under the faculty members at all of the affiliated hospitals. There 221 fellows, 382 American trainees and 136 visiting fellows who took part in our training programs.

This year there were twenty degrees of Master of Science in Human Nutrition awarded. The Institute of Human Nutrition offered 23 courses to 219 students.



Donald F. Tapley, M.D.
Dean of the Faculty of
Medicine

REPORT OF THE DEAN OF THE FACULTY OF MEDICINE • XXXVII

1978—1979

BASIC SCIENCE DEPARTMENTS	<i>Full Time</i>	<i>Part Time</i>	<i>Total</i>
Anatomy	17	6	23
Biochemistry	19	17	36
Human Genetics & Development	22	9	31
Microbiology	27	6	33
Pathology	47	101	148
Pharmacology	19	12	31
Physiology	24	1	25
Totals	<u>175</u>	<u>152</u>	<u>327</u>
CLINICAL DEPARTMENTS			
Anesthesiology	56	32	88
Dermatology	10	32	42
Medicine	147	304	451
Neurological Surgery	4	12	16
Neurology	52	55	107
Obstetrics & Gynecology	40	93	133
Ophthalmology	24	64	88
Orthopedic Surgery	8	55	63
Otolaryngology	5	31	36
Pediatrics	81	182	263
Psychiatry	22	460	482
Radiology	33	83	116
Rehabilitation Medicine	26	55	81
Surgery	50	128	178
Urology	3	49	52
Totals	<u>561</u>	<u>1,635</u>	<u>2,196</u>
TOTAL ALL DEPARTMENTS	736	1,787	2,523
INSTITUTES & CENTERS			
Center for Community Health Systems	3	2	5
Cancer Center/Institute for Cancer Research	26	3	29
International Institute for the Study of			
Human Reproduction	5	0	5
Institute of Human Nutrition	1	4	5
Gertrude H. Sergievsky Center	1	0	1
Totals	<u>36</u>	<u>9</u>	<u>45</u>
SCHOOLS			
Nursing	51	23	74
Public Health	80	133	213
Totals	<u>131</u>	<u>156</u>	<u>287</u>
Totals Departments	736	1,787	2,196
GRAND TOTALS	903	1,952	2,855

XXXVIII • REPORT OF THE DEAN OF THE FACULTY OF MEDICINE

1978—1979

<i>Without Stated Term</i>	<i>Full Time</i>	<i>Part Time</i>
Professor	151	7
Professor of Clinical	18	43
Associate Professor	59	2
Associate Professor of Clinical	23	24
Totals	251	76
<i>Annual</i>		
Professor	4	1
Professor of Clinical	4	7
Clinical Professor	1	38
Adjunct Professor	0	22
Associate Professor	28	0
Associate Professor of Clinical	27	26
Associate Clinical Professor	15	144
Adjunct Associate Professor	0	23
Senior Research Associate	18	3
Assistant Professor	186	2
Assistant Professor of Clinical	80	144
Assistant Clinical Professor	7	347
Adjunct Assistant Professor	0	52
Associate	13	0
Associate In Clinical	13	205
Research Associate	104	41
Senior Staff Associate	17	4
Staff Associate	93	30
Instructor In Clinical	28	471
Instructor	6	2
Assistant In Clinical	4	129
Special Lecturer	0	47
Lecturer	1	134
Visiting Professor	0	6
Visiting Assistant Professor	0	1
Totals Annual	649	1,879
Totals Without Stated Term	251	76
GRAND TOTALS	900	1,955
		900
		2,855

Report of the Association of the Alumni

The prime mission of the Association of the Alumni of the College of Physicians and Surgeons, which was founded as a separately incorporated body in 1857, is to foster and maintain cordial relationships between the College of Physicians and Surgeons and its many alumni, numbering better than 7,000 individuals and including those holding M.D. and Med.Sc.D. degrees as well as those who are awarded certificates in Psychoanalytic Medicine from the College of Physicians and Surgeons. In addition to those whom we number as traditional alumni, as a result of a recent change in our constitution we now number as associate alumni all faculty of the College of Physicians and Surgeons, all Ph.D. graduates of the Basic Sciences Curricula and all Interns, Residents and Visiting Fellows associated with all hospitals which currently affiliate their programs with the College of Physicians and Surgeons. Therefore, in all, our current constituency now numbers well over 10,000 individuals.

During the 1977-78 academic year in addition to the President, those who served the organization in positions of responsibility included: President-elect, Frank E. Iaquinta, M.D., P&S '51; Vice President, Kenneth A. Forde, M.D., P&S '59; Corresponding Secretary, Carmen Ortiz-Neu, M.D., P&S '63; Recording Secretary, S. Jerome Dickinson, M.D., P&S '53; Treasurer, Richard J. Stock, M.D., P&S '47; Assistant Treasurer, Joel D. Weinstein, M.D., P&S '62; Historian, Lowyd W. R. Ballantyne, M.D., P&S '49.

A substantial component of the work completed in any year by the Alumni Association is accomplished through its many standing and ad hoc committees and are chaired by: Alumni Relations Committee, Frank E. Iaquinta, Chairman; Alumni Day Program Committee, Andrew G. Grantz, Chairman; Continuing Education Committee, Edgar M. Housepian, Chairman; Entertainment Committee, Carmen Ortiz-Neu, Chairman; Regional Representatives Committee, Abram J. Abeloff and Gerard M. Turino, Co-Chairmen; Student-Alumni Relations Committee, Carl R. Feind, Alumni Chairman, Calvin Roberts, Student Co-Chairman; Alumni Office Committee, O. Alan Rose, Chairman; Annual Fund Committee, Francis M. Weld, Chairman; Constitution and By-Laws Committee, Herbert B. Wilcox, Jr., Chairman; Editorial Board Committee, Robert J. Weiss, Chairman; Executive Committee, O. Alan Rose, Chairman; Finance Committee, Richard J. Stock, Chairman; Honors and Awards Committee,

Kenneth A. Forde, Chairman, Special Students Committee, Harry M. Delany, Chairman; Self-Study Committee, Edgar M. Housepian, Chairman; Tuition and Student Aid, Edward B. Leahey, Jr., Chairman.

The 1977-78 Annual Fund Report delineates rather dramatically the tangible commitment of P&S Alumni to the College of Physicians and Surgeons. Alumni contributions during the recent fiscal year, excluding the alumni's parallel commitment to the Medi/Center 1 Capital Campaign, totalled better than one half million dollars from close to 50% of the entire alumni constituency. Tim Weld, who chaired this effort, the Annual Fund Committee, as well as each of the Alumni Fund Class Chairmen, are all to be thanked and congratulated for a superb job.

The *P&S Journal*, edited by Robert J. Weiss, and now co-produced by both the medical school and the Alumni Association, successfully marked its first anniversary in its new format. As with any new venture, its first year was not without growing pains, but the overall response from the various constituencies who received the magazine has been supportive.

The alumni of the College of Physicians and Surgeons have historically demonstrated a great interest in student welfare. For the past ten years a substantial component of unrestricted revenue raised through the P&S Annual Fund has been turned over annually to the P&S Club, to underwrite the yearly operating expenses of this student organization which supports, sponsors, and manages almost all of the extracurricular activities for both P&S students as well as for students enrolled in each of the other schools and colleges associated with the Medical Center.

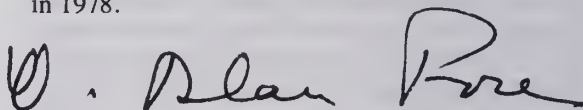
The Student-Alumni Affairs Committee, a standing committee of the Alumni Council, includes within its membership in addition to its alumni constituents, two elected student representatives from each of the four classes at P&S, each of whom operate with full voting privileges on that committee. Examples of activities sponsored by this committee include: a summer jobs program for first-year students, an orientation cocktail party for entering first-year students, as well as a series of forums each year to which the students invite illustrious alumni to speak informally to the student body about both the academic as well as the practical aspects of the practice of medicine.

Alumni Association activities culminate each year with our May Alumni Reunion festivities. This year in response to suggestions received from both the

administration of the medical school and from a substantial sector of alumni in response to a broad-based questionnaire, the traditional one-day program was expanded into a three-day event incorporating both Alumni Reunion Programs and school sponsored programs. Because the event was produced and co-sponsored by both the Alumni Association and the Medical School, the Alumni Association deemed it appropriate to name an Honorary Chairman to head the festivities. That honor was accorded this first year to Professor Emeritus Harry M. Rose. Alumni and their spouses who participated in the three-day event had an opportunity to tour the newly constructed Hammer Health Sciences Center; they also heard a number of excellent scientific papers by alumni colleagues. Social events included a theater party at a Broadway show, a special program for spouses at the Metropolitan Museum of Art, a Gala Dinner Dance at the Pierre and for a number of returning alumni, special Friday evening class reunion events as well.

The 1977-78 P&S Alumni Gold Medal for academic excellence was presented to Helen M. Ranney '47, Professor of Medicine and Chairperson of the Department of Medicine at the University of California at San Diego. According to the 1977-78 Director of the Association of American Colleges, Dr. Ranney is the first and only woman to hold such a title in an American medical school.

The Silver Medal for distinguished service to the Alumni Association and to the College of Physicians and Surgeons was presented to Dorothy Estes '50, immediate Past President of the Association and Assistant Professor of Clinical Medicine at P&S. This year there were two recipients of the Bronze Medal presented annually to the student demonstrating a meaningful degree of interest in the activities of Physicians and Surgeons. They were Peter C. Albertsen and Calvin Roberts, both of whom graduated in 1978.

A handwritten signature in dark ink, reading "O. Alan Rose". The signature is fluid and cursive, with the first name "O." followed by "Alan" and "Rose".

O. Alan Rose, M.D.
President
Association of the Alumni

Annual Report for 1978

Dean of the Faculty of Dental and Oral Surgery



Health Sciences Faculties
Columbia University in the City of New York

8191 an 10074 Journal



Report of the Dean of the Faculty of Dental and Oral Surgery • Director of Service

The administration of the dental school has undergone a transition during this past year. On September 1, 1978 Dean Allan J. Formicola began his tenure as dean of the faculty of Dental and Oral Surgery and Director of the Hospital Dental Service. Dean Formicola succeeds Dean Edward V. Zegarelli who retired after 41 years of service as a faculty member, the last five as dean of the school. Dr. Formicola becomes the 11th dean of the School of Dental and Oral Surgery.

The School of Dental and Oral Surgery is entering a critical period. Dentistry as a profession has many challenges to meet during the upcoming years and these challenges will effect dental education. All of our programs must be strong in order for the school to graduate leaders for the profession. Federal and state governmental attitudes towards the need for dental health manpower along with changing attitudes of practitioners and consumers towards the practice of dentistry will all help shape the future. The dental school must be clear in its goals in order to continue to provide quality educational, research and service programs. The school now has an extremely modern facility in which to offer instruction to its D.D.S., hygiene and postgraduate students. However, much remains to be done to be able to bring the faculty and staff up to the necessary strength to continue to provide superior education, research and service programs. Several of the school's divisions have insufficient full time faculty; therefore, Search Committees have been authorized to recruit full time faculty for the Division of Pedodontics, Periodontics and Prosthodontics (Dental Materials). A Faculty Prac-

tice Plan is under development in order to help attract new faculty and provide more comprehensive dental services on the Health Sciences Campus.

A Planning Committee has been appointed to help plan the next phase in growth for the SDOS. The SDOS has the opportunity as a private institution to explore new programs and offer a unique educational environment. Dentistry, as part of the Health Sciences Center, can contribute towards joint research endeavors. The Planning Committee will consider what programs should be emphasized to keep our school a leading academic dental school.

Faculty

Dean Edward V. Zegarelli retired on September 1, 1978 after 41 years of service. He was honored at the annual Faculty-Student Alumni Spring Dinner Dance, a dinner in June attended by faculty and friends, and a dinner sponsored by the Vice President for Health Sciences in September. Dean Zegarelli was recently selected as Man of the Year by the American Association of Dental Examiners.

The new dean, Dr. Allan J. Formicola, previously served as acting dean (1976-1977) and associate dean (1973-1976) at the New Jersey Dental School. He served at the New Jersey Dental School since 1970, when he joined the faculty as Chairman of the Department of Periodontics. He has held previous faculty positions at the University of Alabama Medical Center and Institute for Dental Research in Birmingham and the Georgetown University School of Dentistry. Dr. Formicola attended Pennsylvania State University and received the D.D.S. in 1963 from

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Georgetown, where he was awarded the M.S. in Periodontics in 1965. Dr. Formicola has contributed to several books in his field and is the author of more than a score of articles in professional journals.

Dr. Solon A. Ellison was appointed in July as Director of the Division of Oral Biology. Dr. Ellison was formerly with SUNY at Buffalo and served in the capacity of Chairman of Oral Biology and Associate Dean of the Dental School for Planning. He received a D.D.S. and a Ph.D. in Microbiology from Columbia University. His appointment brings a full time director to the Division of Oral Biology and will help the school's future research endeavors. Dr. Bernard B. Tolpin was appointed in July to be Director of the TEAM Program. Dr. Tolpin was formerly with Fairleigh Dickinson University, School of Dentistry. Two additional members have been added under the TEAM program—Dr. Christopher A. Starr who formerly was at SUNY at Buffalo and Dr. Howard Rombom who holds a Ph.D. degree in psychology.

Dr. David J. Zegarelli was appointed Director of the Division of Stomatology effective June, 1978 and Dr. Dona E. Wayman was appointed Director of the Division of Dental Hygiene effective June, 1978. Dr. Martin J. Davis was appointed Director of the Division of Pedodontics effective June, 1978. There were 53 new part-time faculty appointments made to the divisions. Eighteen faculty were approved for promotions.

The retirement of Mrs. Patricia McLean, Associate Professor of Dentistry, became effective in June of 1978.

We regret to announce the deaths of Dr. Gilbert P. Smith, Professor and Dean Emeritus on January 5, 1978 and Dr. Carlos M. Giro, Lecturer in Dentistry (Prosthodontics) on July 19, 1978.

D.D.S. Admissions

Two thousand and eight (2008) applicants applied to the first year class entering September, 1978. Of these applicants 1662 were male and 346 female. Minority students constituted 219 applications. Consequently, the Admissions Committee was able to select sixty (60) outstanding students from a highly selective applicant pool to fill this First Year Class.

The Committee on Admissions granted interviews to 400 applicants here at the School, while our Alumni who conduct interviews in California accommodated another 50 applicants in Los Angeles and San Francisco. The addition of Alumni Interviewers on the West Coast enable applicants who are unable to travel to New York to be interviewed on the West Coast. To complete the Class of 60 students, notices of acceptance were sent to 116 applicants, including seven minority students.

The Class of 1982 consists of 50 men and 10 women, including four minority students. All but one possess a bachelors degree, with four holding the masters degree. They are from 31 different colleges and universities throughout the country—while most make their home state along the Eastern Seaboard. Eighty-six per cent (86%) are New York State residents.

D.D.S. Curriculum

As a condition for the continuation of the Federal Capitation Award Program, the faculty, under the leadership of Drs. George A. Minervini and Harriet S. Goldman, is planning this year for an expansion in the Extramural Clerkship Program for dental students. The current clerkship program will be expanded by four weeks so that each senior student will spend six weeks of training in an extramural location. Affiliation agreements have been signed between the SDOS and the following hospitals where students will be rotated: Bronx Veterans Administration Hospital, Beth Israel Medical Center, Kings County Hospital Center, Booth Memorial Hospital, Montrose Veterans Administration Hospital, Lutheran Medical Center, St. Luke's Hospital, Montefiore Hospital and the U. S. Coast Guard Dental Clinic on Governor's Island. The actual rotation of students will begin in August, 1979. Precise educational objectives are currently under development and the program has the prospects of becoming a model one for the nation.

The Training in Expanded Auxiliary Management Program (TEAM) was approved for a three year period in July of 1978. This program is supported by a Federal grant in the amount of \$230,315 for 1978-1979 and for the entire three year period 1978-1981 the award is for \$744,810. The overall purpose of this program is to provide the D.D.S. students an opportunity to participate in and acquire the skills to engage in practicing dentistry with multiple dental auxiliaries. This program developed as a logical extension of a senior elective program started under the direction of the dental auxiliary utilization faculty. Three full time faculty members are now part of the faculty and are directing this educational program. An auxiliary staff of hygienists and dental assistants rounds out the staffing for the program. Students receive didactic instruction in the Junior year and a two week clinical rotation to the TEAM Clinic in the Senior year.

During the past year the Committee on Instruction under the chairmanship of Dr. Nicholas A. DiSalvo completed a review of all courses in the predoctoral program in dentistry. This resulted in a number of intra-course changes. The following are some of the

major curricular changes made:

(1) Clinical instruction in the third and fourth years was changed from a total "modular" method to a "modified block" system. The modular system, in which students were allowed the freedom to schedule the various aspects of dental care needed by their patients, was instituted three years ago on a trial basis with the objective of encouraging a "total patient care" concept. The system allowed situations to develop wherein students sometimes did not receive the appropriate mix of clinical experiences. The new modified block system should allow a closer monitoring of student clinical experiences while still adhering to a total patient care concept.

(2) The length of summer session following the second and third years have been extended by two weeks and the sessions will include five full days each week. This should substantially increase the students' clinic experience and will allow complete elimination of lectures in the fourth year. The latter is important in view of the fact that fourth year students will have much more extensive extramural hospital experience beginning next year.

(3) A new course in Nutrition has been added to the first year curriculum.

There are 11 senior students enrolled in areas of concentration. Approved seniors may spend 80% of their clinic time in a particular discipline such as prosthodontics, pedodontics, periodontics and orthodontics. If accepted into the postgraduate programs, they are given advanced standing for work completed in the senior year. In addition, there are four students enrolled in the D.D.S./MPH program.

Dental Hygiene Admission/Curriculum

Sixty applications were received for admission to the baccalaureate programs. Of these, twenty-eight were enrolled with the majority coming from New York State. Other neighboring states were represented along with Texas and California. There were twenty-two applicants to the Masters program and fifteen of these were enrolled. Most of these came from New York and its neighboring states. All of the current applicant pool were female. The division is initiating a major recruitment program to attract a student body that reflects greater variety in geographic distribution and a better representation of minority and male students.

In 1978, the division presented three weekends of Continuing Education. Weekend I consisted of Radiology 1½ days and ½ day of Oral Health Education and Patient Education; Weekend II presented one day of Oral Screening and Disease Detection and one day of Clinical Instrumentation Technique; Weekend III consisted of 1½ days of Emergency

Techniques in the Dental Office and ½ day of Assertiveness Training.

The curriculum for dental hygiene is designed for three separate programs of study: (1) The Graduate Program, one of only four programs in the United States leading to a Master of Science degree in dental hygiene, prepares its graduates for careers in teaching or administration of dental hygiene programs; (2) The B Program, post-dental hygiene, allows students to expand their background in the liberal arts, emphasizes entry level hygiene teaching and permits students the opportunity to concentrate part of their program in public health, nutrition, speech pathology, and pre-dental education. It is one of only twenty-six such programs in the country; and (3) The A Program, a course of study in the dental hygiene discipline at the third and fourth year of college leading to a B.S. degree in dental hygiene, is designed to prepare students to enter dental hygiene practice. It is one of only twenty-four programs in the country that is at the baccalaureate level only.

Faculty/Dental Hygiene

Dr. Dona E. Wayman was appointed as director of Dental Hygiene on July 1, 1978. In January 1978 she was awarded the Doctor of Education degree from Teachers College, Columbia University. Dr. Wayman was appointed to the National Board Test Construction Committee, American Dental Association and reappointed as Consultant to the Council on Dental Education, Commission on Accreditation.

Professor Marlene Klyvert is serving as reviewer for the N.I.H. Caries Program and is a Consultant to the Council on Dental Education. She has coauthored a textbook on histology with Dr. Letty Moss-Salentijn entitled *Oral Histology and Embryology for the Dental Paraprofessional*. The book will be published in 1980.

Ms. Judy Goodrich serves as chairman of the Committee on Education, New York State Dental Hygienists' Association. Mrs. Johanna Odrich has matriculated in M.P.H. program Columbia University, School of Public Health. Ms. Nancy McVay has been licensed as an expanded function dental hygienist in the State of California. Ms. Linda Bohacek has matriculated toward an M.A. degree in Higher Education and serves as treasurer for the Connecticut Dental Hygienists' Association. Mrs. Olga Ibsen serves as president-elect for the Westchester County component of the American Dental Hygienists' Association and is president of Lambda Chapter, Sigma Phi Alpha. Ms. Valerie Cooke is the faculty representative on Medi/Center funding campaign and the dental hygiene faculty consultant to the Institute of Human Nutrition.

Postdoctoral Dental Programs

With the completion of the new clinical facilities, SDOS voluntary reduction in the numbers of enrolled postgraduate students has been terminated. In line with this policy, there are now twenty-five students in the first year class, an increase of seven over those registered for the second year.

Although the numbers of applicants to postgraduate programs have fallen off nationwide in recent years, SDOS still enjoys a favorable mean ratio of approximately four applicants for each place (this varies from discipline to discipline). There is an increasing number of foreign and female dentists seeking admission to the board qualifying certificate of training programs at Columbia. Our present enrollment includes twelve women and twenty-five men. Of these, one is black, six Hispanic and four Asian. Our foreign students include representatives of Greece, Iran, India, Venezuela, and the Phillipines. Two of our U.S. citizens are from Puerto Rico. In addition to our own postgraduate students, we also provide nonclinical instruction to students enrolled in the postgraduate residency program at St. Luke's Hospital, a Columbia affiliate.

In many ways, the postgraduate programs serve as a resource for enriching undergraduate dental education. Besides the evident advantage of providing clinical instruction by board certified specialists, these programs serve our Senior Honors Area of Concentration students who spend 80% of their curriculum time with the postgraduates. Frequently, we have one such student each in Orthodontics and Periodontics and three in Pedodontics. In addition to the foregoing, the two Columbia Presbyterian dental residents, as well as the six Prosthodontics Area of Concentration students, participate in selected postdoctoral didactic courses.

All of the postdoctoral programs (Endodontics, Orthodontics, Pedodontics and Periodontics) are fully approved by the Council on Dental Education and the courses in conformity with their requirements and guidelines. Two changes have taken place this year in these programs: Dr. Daniel Fine has joined Dr. Irving J. Naidorf in teaching the microbiology and immunology course to both Endodontic and Periodontic students, and Dr. Charles Noback (P&S Department of Anatomy) is now course director for dental postgraduate anatomy.

Research

Dr. David Kaplan, Director of the Dental Auxiliary Utilization Program is studying new instrument delivery systems. Drs. Irwin Dambrot, Martin Handlers and Joseph Kafer are testing the application in the Dental School Clinics of a problem oriented

patient charting system (which they developed for the TEAM Program).

Members of the Division of Endodontics have been engaged in several research projects this year. Dr. Synguck Kim is continuing his investigations concerning blood flow and neural activity in the dental pulp, using vasoactive amines and radioactive Xenon. Dr. Kim has also been successful in preparing videotapes of the microcirculation of the dental pulp. This work is being accomplished as part of his Ph.D. program under the aegis of Professor Shu Chien of the Department of Physiology. Dr. Abel Moreinis, in collaboration with Dr. Melvin Morris, has initiated a project involving the various technical and clinical factors that must be considered in the replantation of teeth. Dr. Naidorf is continuing his investigations of several aspects of Endodontic Immunology and their relationship to the healing process and the inflammatory response in clinical situations.

Drs. Harold Baumash and Louis Mandel, of the Division of Oral Surgery (in a joint study with Drs. Irwin Mandel and Robert Stuchell of Preventive Dentistry) are utilizing sialography, sialochemistry and labial gland biopsy in a continuing study of salivary gland disease.

Since the technique of the surgical removal of salivary stones inevitably predilects the duct to new stone formation because of resultant duct fibrosis, Drs. Baumash and Mandel are attempting to surgically negate such a consequence. Evaluation of the bypassing of the stricture by surgically transplanting the ductal orifice and excising the anterior diseased portion of the duct appears to be a promising approach.

In a multidisciplinary approach, Drs. Victor Sendax, Dennis Bohlin and Joan Galterior are investigating the factors most conducive to success in implant procedures.

The Child Development Laboratory of the Division of Orofacial Growth and Development, under the direction of Dr. Sidney L. Horowitz, is involved with a number of investigations. These include roentgencephalometric studies of craniofacial morphology in children with cleft lip, isolated cleft palate, and combined clefts of the lip and palate. This work is a joint project with Professor M. Bettex and Dr. B. Graf (University of Bern), Dr. L. J. Gerstman (CUNY), and Dr. H. Vinkka (University of Turku). Drs. Alice J. Chabora and Horowitz are continuing their investigations of inheritance patterns in facial clefting.

The characteristic facial and cranial traits found in children who have the syndrome of gonadal dysgenesis (Turner's syndrome and its variants) are

being studied by Drs. Horowitz and Akira Morishima (Pediatrics). Many children who have orthopedic birth defects also show facial dysmorphism, and this is under investigation by Drs. Horowitz, Chabora and Rosamund Kane (Orthopedic Surgery).

Under the direction of Dr. Nicholas A. DiSalvo, Director of the Division of Orthodontics, and Dr. Henry I. Nahoum, Orthodontic Clinic Director, the post-doctoral orthodontic students completed the following studies:

(1) "Changes in the Integumental Profile as Expressed Between Comparisons of Blacks and Whites Concomitant with Orthodontic Treatment."

(2) "A Clinical Investigation of Direct Bonding of Orthodontic Attachments to Teeth."

(3) "Incisor Tooth Retraction and Subsequent Profile Changes in Adolescent and Post-adolescent Patient Using NB as a Reference Plane."

Dr. Martin J. Davis, Director of the Division of Pedodontics, is involved in several studies pertinent to the use of alternative agents for vital pulp therapy in the primary dentition. In particular one study involves investigation of glutaraldehyde as an alternative to formocresol. Additionally, a program to provide dental care for the visually handicapped in the metropolitan area is being developed within the Division of Pedodontics. Ongoing research includes touch and proprioception in cerebral palsy, taste thresholds in cerebral palsy, salivary research in cerebral palsy, and a survey of postdoctoral pedodontic education programs with respect to the teaching aspects of behavior management.

Faculty members of the Division of Periodontics are conducting a variety of studies. Dr. Robert Gottsegen is continuing the investigation of the effect of total thyroid extirpation on salivary chemistry and flow rate, gingival sulcular fluid chemistry and gingival inflammation in the human patient.

Dr. Fine is studying the pathological activity of subgingival adherent and loosely adherent plaque. In this series of studies a plastic strip is placed subgingivally in periodontal pockets of patients having periodontitis or periodontosis. Each plaque component is then tested for pathological activity in a variety of test systems. The goal of these studies is to determine differences in the pathological activity of subgingival plaque collected from periodontitis as opposed to periodontosis patients.

In addition, Drs. Fine, I. Mandel and Susan Friedman are studying the pathological activity of specific bacterial cell envelope fractions of gram negative and gram positive bacteria.

Dr. Fine, in conjunction with Mr. Jay Zelinsky (Pathology), is also studying the effects of polymor-

phonuclear leucocyte migration on basement membrane integrity. In this study the principle of PMN chemotaxis is related to the proposed barrier effects of the basement membrane. Radioactive markers will be used to determine membrane alterations.

Drs. Fine and Morris are continuing their joint studies on endotoxins in and on root surfaces. The most recent results indicate that endotoxins may be bound to calcium apatite in such a way as to negate its effects.

Dr. Morris has continued his studies on the effect of root surfaces on bone growth and has been able to show that there is an Inhibitory Factor in both diseased and healthy roots and that this may be an important factor in periodontal hemostasis. Dr. Morris is also continuing his long term project of studying the biology of the human root and its relationship to the adjacent connective tissue. The most recent results show that the implantation of decalcified autogenous bone adjacent to a healthy root produces a functionally oriented group of periodontal fibers. This is the first time that this has ever been shown and may be the first step toward practical regeneration of lost periodontal tissues.

Dr. Bernard Moskow is continuing his study on the "correlation of human gingival and clinical histopathologic tissue types." He is also carrying on a study of the internal morphology of alveolar crest bone to determine its response to the long term effects of inflammation. These observations are being made on a microscopic, macroscopic and microradiographic level in human autopsy material. A pilot study has also been initiated by Dr. Moskow for assessing the suitability of using congenitally athymic (nude) mice for studies of host resistance in periodontal disease. In addition, Dr. Moskow is carrying out a clinical assessment of the healing potential of a variety of periodontal lesions heretofore not thought to be amenable to regeneration.

Drs. Herbert Oshrain and Albert Salkind in association with Dr. Robert Gottsegen are conducting a clinical investigation of the effects of endotoxin solvents on periodontally diseased root surfaces. Initial results following the use of trichloroacetic acid in various strengths and forms and of citric acid have been promising in relation to the attachment of gingiva to denuded root surfaces and to the regeneration of periodontal bone and attachment. Drs. Salkind, Oshrain and Morris are continuing their study recording the time period of pellicle formation on root surfaces. In association with Dr. I. Mandel, Dr. Oshrain has been engaged in the longitudinal study of the periodontal state of patients on long-term immunosuppressives.

Drs. Arnold Geiger and Bernard Wasserman are

continuing their analysis of the data in their large scale study of occlusal and periodontal interrelationships. Dr. Leonard Hirschfeld along with Dr. Wasserman and Dr. Alan Winter are continuing to contribute significant new knowledge to the periodontal literature by their ongoing analysis of over 600 cases of periodontally treated patients, average duration of treatment now being more than 27 years.

Members of the Division of Preventive Dentistry have been engaged in a variety of studies involving both laboratory and clinical procedures. Drs. I. Mandel, Stuchell and Camille DiPaola have been studying host factors in caries resistance, concentrating on salivary anti-bacterial factors (lysozyme, lactoferrin, lactoperoxidase and secretory IgA). New and improved methods have been developed for quantitating these components and comparative studies of caries resistant and caries susceptible subjects are underway. Dr. David Abelson has been examining plaque pH after sucrose challenge in these two groups and Dr. Spyros Vratsanos has been analyzing the spectrum of plaque acids formed, utilizing a very sensitive chromatographic procedure he developed. Caries resistant people do *not* exhibit the usual drop in plaque pH after sucrose, produce significantly less total acid and much less lactic acid than susceptible subjects. Ms. Judith Skier and Dr. I. Mandel are studying periodontal disease in caries resistant subjects and Ms. Laura Bardach, Skier and Dr. I. Mandel are studying the nature of their diet. It is already apparent that the dietary challenge is comparable in resistant and susceptible subjects.

Drs. I. Mandel, Stuchell and Baurmash have been examining changes in electrolytes and proteins in chronic recurrent parotitis and Sjogren's Syndrome; valuable diagnostic parameters (such as elevated lactoferrin) have been elucidated. Drs. Michael Z. Marder and I. Mandel are studying salivary immunoglobulins in juvenile diabetics and note a significant elevation in IgG and IgM, suggesting a salivary gland basement membrane defect in those patients. They are also studying patients with hyperparathyroidism, examining saliva before and after parathyroidectomy. Dr. Stuchell (in a joint study with Drs. Richard S. Rivlin and Robert McConnell, Institute of Nutrition) is studying sialochemistry in hypo and hyper-thyroid patients before and after thyroid therapy. With Dr. Andrew Blitzer (Otolaryngology) he is studying abnormal salivary proteins in patients with salivary gland tumors. He has also been examining saliva from such patients in a joint study with Dr. Haskell David, Sinai Hospital in Detroit, Michigan.

Drs. Leslie Burstein and I. Mandel are examining the role of phospholipids in oral ectopic calcifications

and have shown (with Dr. Adele Boskey, Hospital for Special Surgery) that phospholipids extracted from submaxillary gland stones can initiate calcification in an *in vitro* system.

Dr. Vratsanos, who developed a method for quantitatively separating cationic proteins from saliva, has utilized this technique in collaborative studies with other investigators. It is becoming apparent that cationic proteins are involved in modifying permeability of the enamel surface and tooth stain formation.

Dr. Abelson and Ms. Skier have been conducting a series of clinical studies on the effect of new mechanical devices on plaque removal and the effect of antiacid agents on plaque pH.

Drs. Oshrain and I. Mandel are continuing to investigate the effect of long term immunosuppression in renal transplant patients on the rate of progression of periodontal disease. Drs. Oshrain and Salkind are studying the effect of acid treatment of periodontally involved cementum on subsequent re-attachment.

Dr. Robert Breakstone has been participating in a joint study with Dr. Mata Nikias (Public Health) on patient compliance factors in preventive dentistry; with Dr. Harold Linn and Dr. Robert Knepper he is studying the effect of dietary modifications on periodontal disease in monkeys.

Dr. David J. Zegarelli, Director of the Division of Stomatology is currently concerned with electron microscopic investigation of interesting and rare intraoral lesions, particularly tumors, in hope of yielding information important in histogenesis. In conjunction with Dr. Elena Zegarelli (Pathology) and Dr. George Hyman (Medicine) and Dr. Bruno Fingerhut (Urology), he is conducting studies utilizing autoradiography in the diagnosis of premalignant lesions. Further analysis is continuing on biopsy specimens taken by Dr. Zegarelli to shed some light on modifying current biopsy technique procedures.

Continuing and expanding research in salivary analysis, Dr. Marder (in cooperation with Dr. I. Mandel) has been investigating salivary electrolytes, enzymes, immunoglobulins and carbohydrate fluctuations in various systemic disease situations including, diabetes, hyperparathyroidism, and other endocrinopathies.

This past year staff members of the Facial Pain Clinic published seven papers. Furthermore, research papers were presented at meetings of the International Association for Dental Research and the Second World Congress of the International Association for the Study of Pain. The Facial Pain Clinic combines primary patient care with extensive clinical research activities. These research activities include the areas of psychology, lead by Mrs. Pamela Lund, and sociology, by Dr. James Lipton. Drs. John Var-

oscak, Frank Petronella and Dean DeLuke are engaged in various clinical studies. Collaborative efforts with the Department of Psychiatry included studies in signal detection theory with Dr. Crawford Clark and pharmacology with Dr. James Perel.

Drs. Austin H. Kutscher, Herbert D. Ayers and Jack Weiner of the Psychiatric Institute Dental Service, in collaboration with Drs. Arthur C. Carr (Psychiatry), Robert DeBellis (Medicine), Patricia Tretter (Radiotherapy), Nathan Lefkowitz (Public Health) now deceased, Bernard B. Schoenberg (Psychiatry), David Peretz (Psychiatry), Ivan K. Goldberg (Psychiatry), Maxwell Abramson (Otolaryngology), Andrew Blitzer (Otolaryngology), Irene Seeland (Psychiatry), and Ms. Elizabeth Robinson, R.D.H., are continuing investigations of the usefulness of various therapeutic modalities for the care of mouth problems of patients dying of oral cancer as well as the mouth problems of patients dying from diseases not originating in the oral cavity. These studies include new approaches to and useful efforts for the control of pain, infection, loss of function and dryness, etc. The role of the dentist and dental auxiliary team in home care programs for such patients is being studied as well. These investigators also are studying clinical symptoms, clinical signs and laboratory tests in a pilot retrospective study to find individual or group indicators of terminality (irreversible disease in a final stage) with high predictive value.

Drs. George A. Hyman, Ralph Veenema, Marian Johnson and Bruno Fingerhut of the Department of Medicine and Urology, together with Dr. Kutscher and Ms. Robinson are working on the development of a clinical diagnostic and predictor tools for use in following and caring for, and in the management of oral premalignant and malignant diseases; it is hoped this will be of special value in monitoring chronic "pre-malignant" lesions of the mouth.

Investigations are continuing in regard to long-term problems arising in the mouth and related to anticipatory grief, acute grief and bereavement by the team of Drs. Kutscher, Arthur C. Carr, Robert DeBellis, Lester C. Mark, Patricia Tretter, Nathan Lefkowitz, Bernard B. Schoenberg, David Peretz, Irene Seeland, and Ivan K. Goldberg together with Drs. Ayers, Daniel Cherico, Ellen Hosiosky, Joseph DeLisi, Jay Weiss, Jack S. Weiner and William Baral.

Drs. Kutscher, Schoenberg, Carr, DeBellis, Lefkowitz, Abramson, Blitzer, Mary Curnen (Public Health), James Wolff (Pediatrics), Ms. Robinson and others are undertaking the study of approaches to the psychosocial and medical-surgical management of patients with premalignant lesions, employing ul-

cerative and/or erosive lichen and laryngeal lesions as initial models.

Drs. Kutscher, Schoenberg, Carr, E. V. Zegarelli and others of the aforementioned team are further investigating the acute vulnerability of the mouth as a target organ for disease states of psychogenic origin or those precipitated by psychologically traumatic events; these studies deal with an overview as well as individual disturbances of significance to all involved in the health care of the oral cavity and regions contiguous to it.

Drs. Kutscher, Lester C. Mark (Anesthesiology) and Leonard Brand (Anesthesiology) have undertaken a study of "on demand" use of nitrous oxide-oxygen therapy in hospitalized patients with intractable pain from terminal disease states. The same team, headed by Dr. Mark, has also undertaken a study of the use of acupuncture in the same patient population.

A clinical human research program (initiated in 1974) designed to investigate the role of the endosseous blade implant in restorative dentistry is still in progress. An application was made this year to N.I.H. for funds to expand and support the project. Dr. Albert Kurpis and Mr. Berd Feredjian (senior student) collaborated on a study to develop grid designs aimed at stabilizing dental radiographs. Summer fellowship funds supported this project.

Drs. Stanislaw Brzustowicz and Edward A. Cain, Jr. are investigating the clinical significance of the topical application of superoxol with controlled temperatures in the bleaching of tetracycline stained teeth in the permanent dentition.

Some New Programs Offered by the School of Dental and Oral Surgery

1. Facial Growth and Craniofacial Birth Defects—Monthly Seminar offered to Oral Surgery Residents at the Roosevelt Hospital. Dr. Horowitz, Division of Orofacial and Growth Development.

2. Oral Health Care Delivery to Mentally Retarded Children and Adolescents at the Manhattan Development Center. Dr. Martin J. Davis and Staff of the Division of Pedodontics.

3. A Family Dentistry Elective Program for Juniors and Seniors. A social worker and nutritionist are part of the program. Dr. Harriet Goldman and Staff of the Division of Community Dentistry.

4. Use of Psychopharmacologic and Narcotic Analgesic Agents in Care of Artificially and Terminally Ill Patients. Survey conducted by two dental and medical students under the Direction of Dr. Kutscher—Fellowship Program from the American Cancer Society, New York City Division, Inc.

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5. Course on I.V. Sedation Techniques to Postgraduate Students in Pedodontics and Periodontics. Dr. Mark Jaffe, Division of Oral Surgery.

Campaign Drive

With our new clinics in operation for more than a year, the 1978 focus of the MEDI/CENTER I capital campaign for dentistry was on phase II, the raising of endowment funds. Under the co-chairmanship of Drs. Joseph M. Leavitt and Nathan M. Sheckman, the campaign added another \$200,000 this year, for a cumulative total of \$8.4 million. The year also saw further expansion of campaign activity, as more and more alumni, as well as grateful patients and members of the business community, have become involved.

Highlights of the MEDI/CENTER I Activity included well-attended alumni receptions held in conjunction with the ADA meeting in California on October 21st, 22nd, and 23rd; a number of telethons conducted in New York by alumni, faculty, and students; a memorable celebration of the successful achievement of the Doctors' Fund \$2 million goal—in which dental faculty played a key role, and the announcement of the special program to endow the Edward V. Zegarelli Chair in Stomatology.

In addition, plans were begun for the "Wall of Honor" that is to have a special place at the School, to provide permanent recognition to all of those who have given \$2500 or more to the capital objectives of The Fund for MEDI/CENTER I for Dentistry.

The continuing momentum of the MEDI/CENTER I campaign can be credited to the hard work of the Co-chairmen Drs. Leavitt and Sheckman; the Dean's Advisory Committee; Dr. George A. Minervini, Chairman of Faculty Solicitations; Dr. Morton L. Shapiro, Chairman of the overall Alumni Campaign; Dr. Herbert Pinsley, Chairman of the Orthodontic Alumni Campaign; Mrs. Carolyn Harbourn, Chairman for the Dental Hygiene Alumni, and Dr. Gerard L. Courtade, Chairman of the Committee for Endowment of the Zegarelli Chair.

This past year has seen the commitment of 87 new alumni to the campaign who together are responsible for \$75,450 in new money for the school. Dr. Arthur Kulick, class of '26, made a personal pledge of \$10,000. The School has also received significant support, and wishes to thank the Union Pacific Foundation for its gift of \$50,000, the Avon Products Foundation for \$25,000 and Colgate-Palmolive for its increased support of the campaign, now totalling \$30,000.

The expansion of the campaign drive across the country has brought with it new leaders who are interested in helping the SDOS achieve its goal. With

such a cohesive and dedicated leadership the SDOS will achieve its targeted goal of \$15 million.

Hospital Dental Service

The Presbyterian Hospital Dental Service is under the supervision of Dr. Louis Mandel who serves as the Associate Director of the Service. The report which follows was prepared by Dr. Mandel.

In the short span of three years during which the residency program has been in existence, the Presbyterian Hospital Dental Service has become firmly integrated into the hospital's health care system, making the full scope of dentistry available to meet the needs of the hospital's in- and out-patient population. However, inherent in such a commitment was the necessity to have the attending dentists as full-fledged members of the medical staff and this was accomplished with the recent revisions of the Presbyterian Hospital's Medical Staff regulations, bringing them in line with those hospital dental programs that strive for excellence of care and leadership in the profession.

The commitment to a superior dental service also required that the full range of dental services mandated by the American Dental Association's Commission for Hospital Accreditation be offered to the patient population. Through the cooperation of the hospital Administration and the Departments of Medicine and Surgery, the Dental Service has gained the opportunity to exercise all clinical privileges associated with an active and flourishing dental service and attained an independence commensurate with other hospital surgical services. As a consequence, complete accreditation of the hospital's dental service and residency program was received from the American Dental Association's Councils on Hospital Dental Service and Dental Education.

The program requires a dental staff which is not only highly qualified in competence and skill, but also possesses an excellent capacity for teaching. Therefore, it was necessary to increase the size of the professional staff, which now consists of 82 members, 31 of whom have admitting privileges. All specialties and disciplines in dentistry are now adequately represented.

The Presbyterian Hospital Residency Program in General Dentistry is a form of postdoctoral professional education which offers a particularly attractive opportunity for advanced and comprehensive clinical experience in a hospital setting as well as additional training in those sciences basic to dental practice. The program proposed for the two dental residents has been designed to allow clinical exposure in a variety of dental fields. The residents are assigned to the oral

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surgery, restorative dentistry, endodontics, periodontics, maxillofacial, prosthodontics, pedodontics and orthodontics clinics. Their curriculum includes radiology, pharmacology, oral medicine and clinical pathology, head and neck anatomy, temporomandibular joint seminars and psychiatry. In addition, the residents attend journal club sessions and conferences, oncology, and infectious disease. Block assignments are made to the Department of Anesthesiology, where the residents work for one month, and to the Department of Pathology, for four weeks. The residents also have been encouraged to partake in research and are now engaged in an on-going study of jaw implants.

It is obvious that a program such as ours could only have been made possible through the close cooperation of all the Presbyterian Hospital services and we are indeed very grateful to the Hospital and to the directors of service for their generous aid.

The ability of the Dental Service to deliver dental care to hospital inpatients and to ambulatory medically and physically handicapped individuals has been greatly augmented by the newly completed reconstruction and renovation of the School of Dental and Oral Surgery. The Special Services Clinic for the handicapped, located on the ninth floor of the School, was incorporated into the design of the new school. The aspirations of the Dental Service have come to fruition with the completion of construction in the summer of 1977. The new facility serves as the focal point for the delivery of dental care by the dental residents.

Under the guidance and direction of the attending staff, the dental residents have been able to provide an unprecedented range and quality of dental services for hospital patients. As the Dental Service continues to develop, numerous additional benefits, both for the patient and the hospital, are expected. For example, the Division of Pedodontics, in association with the Presbyterian Hospital Department of Pediatrics, is offering complete dental care, under general anesthesia in the operating room, for physically handicapped and/or emotionally disturbed patients who otherwise might not receive adequate or any dental care. This service is a growing aspect of the residency program. Under the guidance of Drs. Davis and Robert Kowek, the Pedodontic Division of the School of Dental and Oral Surgery has moved aggressively to offer this care to the large reservoir of patients that require such treatment. A symbiotic relationship has developed offering significant benefits to the School's Pedodontic postgraduate program and to the hospital's dental residency. Continued growth of this parameter of pedodontics can be expected.

Another example of inter-service cooperation and improved medical-dental communication is the representation of the Dental Service on various hospital committees. Dr. Louis Mandel serves on the Emergency Committee, Operating Room and Anesthesia Committee and Utilization Review Committee. Dr. Irving J. Naidorf is on the Communicable Diseases and Antibiotics Committee and Staff Committee; Dr. Austin H. Kutscher is on the Medical Care Evaluation, Medical Record and Pharmacy Committees; Dr. Stanislaw Brzustowicz serves on the Parking Committee; Dr. John V. Donovan is on the Electronics Safety Committee and Joint Radiation Safety Committee; Dr. David J. Zegarelli is on the Diagnostic Laboratories Committee; Dr. Joan Galterio is on the House Staff Committee.

Association of Dental Alumni

The School of Dental and Oral Surgery's Alumni Association sponsored several special events. The President of the Alumni Association, Dr. Edgar Gattegno, reports the following: On March 3, 1978, Dean's Day (Annual Home Coming) was held. The Birnberg Alumni Research Award was presented to Dr. David Scott, Director of the National Institute of Dental Research. The Annual Dinner Dance/Senior Farewell was held on April 2, 1978 at the Tammybrook Country Club in Cresskill, New Jersey. As mentioned above retiring Dean Zegarelli was honored at this event. On August 30, 1978 the organization sponsored a Freshman Orientation Luncheon held in the Hammer Health Sciences Building. In order to greet the new dean, a Meet the Dean's Night was held on November 8, 1978. The organization was gratified at the large turnout for the event and Dean Formicola expressed his personal thanks to the alumni organization for helping to make him feel welcome at Columbia. Completing the year's activities was a cocktail part held at the Greater New York Dental meeting on December 5, 1978 at the New York Hilton Hotel.

Prizes:

General Awards of Achievement: Alpha Omega Fraternity Prize to Dr. John E. Dulski; Psi Omega Award to Dr. Kenneth M. Murphy; Van Woert Award to Dr. Deborah Griffin and Dr. Kathryn Duncan; Ella Marie Ewell Award to Dr. Allen F. Avrutin; International College of Dentists (U.S. Section) to Dr. Priscilla Konecky.

Omicron Kappa Upsilon Keys (Honorary Dental Fraternity) presented to: Drs. Daniel S. Budasoff, John E. Dulski, Ronald F. Gerhard, Kenneth M. Murphy, John F. Schmidt and Weston P. Wilson.

Divisional Awards of Excellence: Endodontics to

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Dr. Deborah V. Griggin; Operative to Dr. Daniel S. Budasoff; Orofacial Growth and Development to Dr. Alice J. Chabora; Oral Biology to Dr. Ronald F. Gerhard; Oral Surgery to Dr. Mitchell L. Beck; Orthodontics to Dr. Kenneth M. Murphy; Pedodontics to Dr. Francis J. Stapleton; The William Bailey Dunning Medal in Periodontics to Dr. Ronald F. Gerhard; Preventive Dentistry to Dr. Rochelle Satanoff Solomon; The Rowe-Wiberg Medal in Prosthodontics to Dr. Daniel S. Budasoff; Stomatology to Dr. John F. Schmidt.

Awards of Achievement: American Academy of Oral Medicine to Dr. John E. Dulski; American Academy of Dental Radiology to Dr. John E. Dulski; American Academy of Periodontology to Dr. Leslie S. Burstein; American Academy of Oral Pathology to Dr. Richard Fratello; American Association of Orthodontics to Dr. Robert P. Ziccardi; American College of Dentists to Dr. Daniel S. Budasoff; American Dental Society of Anesthesiology to Dr. Alice J. Chabora; American Society of Dentistry for Children to Dr. Mary C. Concilio; Society of Diplomates of the Board of Oral Surgery to Dr. John F. Schmidt; Dentists Supply Company Award to Dr. Mark A. Tepper; Long Island Academy of Odontology to Dr. Leslie S. Burstein; Arthur Merrit Award to Dr. Deborah V. Griffin; C.V. Mosby Book Awards to Drs. Joan Galterior and Weston P. Wilson; American Association of Endodontists to Dr. Frank Iacono; Herbert J. Bartelstone Award to Dr. Harry Dym; Italian Dental Society to Dr. John F. Schmidt; American Academy of General Dentistry to Dr. Daniel S. Budasoff; William Jarvie Society to Drs. Allen F. Avrutin, Mitchell L. Beck, Leslie S. Burstein, Alice J. Chabora, Mary C. Concilio, Larry J. Feder, Stanley M. Moshman, Kenneth M. Murphy, Neal B. Nissen, Peter M. Rumack and Joseph C. Shyong.

Dental Hygiene Awards: Albert Stevenson Gold Medal to Ms. Ellen Haberman; Clinical Proficiency Award to Ms. Anne Lyons; Philip J. Blackerby Award to Ms. Margarita Ayala.

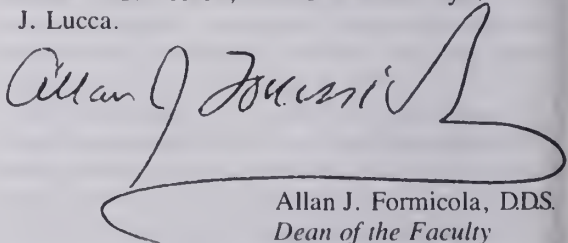
Dental Hygiene Award of Achievement: Award to President of Junior American Dental Hygienists' As-

sociation, Columbia Chapter to Ms. Susan Menduni.

Sigma Phi Alpha Keys (Honorary Dental Hygiene Society) presented to Ms. Eileen Doody, Ms. Karen Whritenor.

Donors:

The School of Dental and Oral Surgery wishes to express appreciation for contributions made in support of its programs by many individuals and organizations. Among the donors are: The Robert Wood Johnson Foundation, Inc., The Colgate-Palmolive Company, Miss Jessica Levy, Dr. Lawrence Calagna, Dr. Raymond F. Johnson, Jr., The Miles Hodsdon Vernon Foundation, Inc., Ms. Virginia Hanna, The Zlinkoff Fund, The Max & Eva Delfiner Foundation, The Goldman Sachs Fund, The Lewittes Foundation, Dr. Martin Ames, Dr. Harold Darwin, Dr. Sidney Hurwitz, Dr. Mortimer Karmioli, Dr. David Salzberg, The Walter Dental Supply, The First District Dental Society (Henry Spenadel Fund), Mr. Joseph L. Muscarelle, Mr. Richard A. Plehn, The Block Drug Company, The Clairrol Company, Dr. N. Lenchner, Dr. Marvin Mansky, Dr. Herbert Oshrain, Dr. Stanley Kitzi, The William Rosenwald Family Fund, Dr. Stephen Silston, Dr. Robert Baldinger, Dr. Harold Z. Levine, Dr. Herbert Weiss, Mrs. Edmund Applebaum, The Landsman & Katz Foundation, Inc., Dr. Clarence Furuya, The Hearst Foundation, The Overbrook Foundation, Dr. L. Rebhun, The Ralph & Frances Dejur Foundation, Mr. & Mrs. A.D. Sperber, The William & Selma Frankel Foundation, The Association of Dental Alumni, Mr. Ira Hechler, The A.A.I.D. Northeast Section, The Blythedale Children's Hospital, Lever Brothers Company, Dr. Albert Salkind, Dr. Bernard Wasserman, Dr. Clifford Stern, Dr. Harold D. Linn, Dr. & Mrs. Murray Hirsch, Mrs. Lottie Sheib, Mr. Peter Sheib, Dr. Robert Breakstone, The Warner-Lambert Foundation, Ms. Isabel G. Lane, Mr. Dani Seigel, The American Society of Dentistry for Children, The American Fund for Dental Health, Dr. Kenneth C. Deesen, Dr. Norman W. Boyd, Dr. John J. Lucca.



Allan J. Formicola, DDS.
Dean of the Faculty
of Dental and Oral Surgery

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Report of the Chairmen of The Fund for MEDI/CENTER 1

The past year's endeavors brought The Fund for MEDI/CENTER 1 to a December 1978 total of \$101,688,000 in gifts, grants, and bequests for the capital objectives of The Presbyterian Hospital and Columbia University's Health Sciences Faculties. This leaves some \$32 million to be raised to complete our goal of \$133.75 million announced five years ago. It has been a rewarding and successful campaign thus far, thanks to the dedication, perseverance, and hard work of hundreds of individuals who make up the MEDI/CENTER 1 volunteer organization.

Under the co-chairmanship of Drs. John K. Latimer and Edward B. Schlesinger, the Doctors' Fund surpassed its \$1.5 million goal, ending the year with \$2.1 million in personal gifts from Columbia-Presbyterian physicians, dentists, and scientists. This record-breaking level of support for capital campaign objectives is an achievement unequaled in the history of the Medical Center.

The Corporations Committee, under the leadership of Mr. Ralph F. Leach, was within \$500,000 of its \$10 million goal at year's end, and has amply demonstrated that the business community regards this Medical Center as a vital and viable institution, a health resource important not only to the city, but to the nation.

Thanks to the able leadership of President William J. McGill and Dr. Paul A. Marks, Vice President for Health Sciences, more than \$18 million in capital funding was granted by agencies of the state and federal governments.

The various alumni constituencies have also rallied to our cause. For the School of Dental and Oral

Surgery, the organization co-chaired by Drs. Joseph M. Leavitt and Nathan M. Sheckman has raised \$8.4 million. For the College of Physicians & Surgeons, Co-chairmen Gerard M. Turino, M.D. and J. Lawrence Pool, M.D., report a total of \$10.9 million given or solicited by P&S alumni. In the School of Nursing, a campaign under the co-chairmanship of Mr. Carl W. Desch, Mrs. Robert J. Lewis, and Mrs. Jean Mackay Rockefeller has raised more than 26 percent of its objective of \$2.5 million; this campaign was begun two years after the announcement of the overall MEDI/CENTER 1 program.

The Fund for MEDI/CENTER 1 has made a difference at Columbia-Presbyterian Medical Center. Some of the tangible results are the new Julius and Armand Hammer Health Sciences Center with its superlative Augustus Long Library, a totally renovated and re-equipped School of Dental and Oral Surgery, new emergency facilities in Vanderbilt Clinic, renovated patient care areas in the Eye Institute, four completed floors in the new Babies Hospital wing, modernized quarters for the School of Public Health, renovations in the P&S building, and an increase of \$23 million in the endowments of the Health Sciences Faculties. It is my hope, as I submit this final report to you as Chairman of The Fund for MEDI/CENTER 1, that all who have been involved in this monumental effort share with me and Co-chairman Lilley in the pride at what has been accomplished.

Effective January 1, 1979, the Trustees of the Fund agreed to my recommendation that Ralph F. Leach assume the chairmanship of The Fund for

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FOR MEDI/CENTER I

MEDI/CENTER I. I look forward to working with him in my new capacity of Chairman of the Executive Committee, and know that under his able leadership you will see the next phases of the campaign to their successful completion.



Harold H. Helm, Chairman



Robert D. Lilley, Co-chairman

*MEDI/CENTER I Honor Roll of Gifts
(cumulative to 12/78)*

LEADERSHIP GIFTS

Anonymous \$1,250,000 for Columbia University Endowment
Anonymous \$1,500,000 for the Edna McConnell Clark School of Nursing Endowment
The Brookdale Foundation \$1,100,000 for the Augustus Long Library
The Edna McConnell Clark Foundation \$1,000,000 for The Presbyterian Hospital
James M. Clark \$2,283,750 for The Presbyterian Hospital (3 gifts)
The Commonwealth Fund \$5,000,000 for Columbia University and The Presbyterian Hospital
The Charles A. Dana Foundation \$1,200,000 for Endowment and Construction (3 grants)
Armand Hammer Foundation \$5,000,000 for the Julius and Armand Hammer Health Sciences Center
The Robert Wood Johnson, Jr., Charitable Trust \$1,250,000 for Endowment and Construction (3 grants)
The Kresge Foundation \$2,500,000 for the Julius and Armand Hammer Health Sciences Center
Mrs. Robert James Lewis \$1,000,000 for the Byron Stookey Professorship in Neurological Surgery
The J. M. Foundation \$800,000 and Mrs. H. Lawrence Bogert \$200,000 for the Jeremiah Milbank and Margaret Milbank Bogert Teaching Center
Estate of James S. Lynch, Jr. \$1,000,000 for the Departments of Medicine and Neurological Surgery
The Andrew W. Mellon Foundation \$1,250,000 for the Julius and Armand Hammer Health Sciences Center

Morgan Guaranty Trust Company \$1,825,000 including \$1,625,000 in a special gift to Columbia University

Muscular Dystrophy Associations of America, Inc. \$1,632,990 for the H. Houston Merritt Clinical Research Center (2 gifts)

Sergievsky Charitable Trust \$4,048,000 for Endowment of the Gertrude H. Sergievsky Center for the Study of Epilepsy and Cerebral Palsy

Texaco, Inc. \$1,000,000 for Columbia University and The Presbyterian Hospital

Estate of Frances Ryder Walker \$4,603,864 for Columbia University Endowment

DeWitt Wallace \$1,600,000 for the DeWitt Wallace Endowment Fund in Urology in honor of John K. Lattimer, M.D., and for The Presbyterian Hospital (2 gifts)

Lila Acheson Wallace \$1,470,000 for the Frank E. Stinchfield Professorship in Orthopedic Surgery
Samuel J. & Evelyn L. Wood Foundation \$1,000,000 for the James Winston Benfield Professorship in Operative Dentistry

Division of Cancer Research Resources and Centers, National Cancer Institute, National Institutes of Health \$5,890,095 for the Cancer Research Center

The State Education Department, The State of New York \$7,000,000 for the School of Dental and Oral Surgery and the Julius and Armand Hammer Health Sciences Center (2 grants)

Bureau of Health Manpower, U.S. Public Health Service, Dept. of Health, Education and Welfare \$4,489,800 for the School of Dental and Oral Surgery

MAJOR GIFTS

Airco, Inc. \$115,000 unrestricted and for the Charles S. Munson Memorial

Anonymous \$150,000 unrestricted

Anonymous \$200,000 for The Presbyterian Hospital, Babies Hospital, and the Rudolph N. Schullinger Professorship in Pediatric Surgery

Anonymous \$200,000 for the Augustus Long Library

Anonymous \$400,000 unrestricted

Anonymous \$647,270 for Columbia University Endowment

Anonymous \$665,429 for Columbia University Endowment

The Vincent Astor Foundation \$500,000 for Babies Hospital

Avon Products Foundation, Inc. \$150,000 for the Department of Medicine and the School of Dental and Oral Surgery

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FOR MEDI/CENTER 1

ankers Trust Company \$100,000 unrestricted
he Bell System \$300,000 unrestricted
ethlehem Steel Corporation \$100,000 unrestricted
odman Foundation \$100,000 for Columbia Uni-
versity Nursing Scholarship Endowment
ooth Ferris Foundation \$150,000 for the Julius and
Armand Hammer Health Sciences Center
ristol-Myers Fund \$120,000 unrestricted and for
the Gavin K. MacBain Memorial
urlington Industries Foundation \$125,000 unre-
stricted
he Buttenwieser Family \$125,000 for the Julius and
Armand Hammer Health Sciences Center and the
Medical and Surgical Services (2 gifts)
PC International \$100,000 unrestricted
he Louis Calder Foundation \$100,000 for the Julius
and Armand Hammer Health Sciences Center
lary Flagler Cary Charitable Trust \$293,363 for
Babies Hospital
elinese Corporation \$100,000 unrestricted
hase Manhattan Bank \$100,000 unrestricted
hemical Bank \$200,000 unrestricted
unwalke Trust \$250,000 unrestricted
he Charles Edison Fund \$100,000 for the Rudolph
Schullinger Professorship in Pediatric Surgery
he Equitable Life Assurance Society \$100,000 for
the Robert F. Loeb Professorship in Medicine
xxon Corporation \$250,000 unrestricted
ye Cancer Foundation \$250,000 for the Edward S.
Harkness Eye Institute (2 grants)
irst National City Bank \$175,000 unrestricted
Mrs. Edward H. Gerry and The William Stamps
Farish Fund \$500,000 for The Presbyterian Hos-
pital, Babies Hospital, and unrestricted
state of Percy Hance \$200,000 for the Augustus
Long Library
enry U. Harris \$100,000
offman-LaRoche Inc. \$140,000 unrestricted
enry H. Hoyt \$137,000 for the Medical Service of
The Presbyterian Hospital
BM Corporation \$750,000 for The Presbyterian
Hospital
he Henry J. Kaiser Family Foundation \$125,000
for the Julius and Armand Hammer Health Sci-
ences Center
Mr. & Mrs. Kerry King \$226,740 for the Augustus
Long Library
Charles R. Lachman \$173,825 for Columbia Uni-
versity Endowment
he Loomis Foundation \$100,000 for The Presbye-
terian Hospital
siah Macy, Jr. Foundation \$300,000 for the Ambu-
latory Care Program
anufacturers Hanover Foundation \$100,000 unre-
stricted

The Merck Company Foundation \$100,000 for Co-
lumbia University and The Presbyterian Hospital
Dr. Katharine Merritt \$150,000 for the Rustin McIn-
tosh Professorship in Pediatrics
Charles L. McCune \$152,500 for various purposes
Mrs. Barbara Michel \$750,000 for a Professorship in
Surgery
Mr. & Mrs. Clifford W. Michel \$250,000 for the
Cancer Research Center
The Dunlevy Milbank Foundation \$350,000 unre-
stricted
The Milliken Foundation \$125,000 for the Robert F.
Loeb Professorship in Medicine
Mobil Foundation \$100,000 unrestricted
Leo Model \$106,360 for The Presbyterian Hospital
Research Endowment
Mrs. Henry Moses \$500,000 for the Lucy G. Moses
Brain Research Laboratories in the Merritt Clini-
cal Research Center
The Munson Foundation \$150,000 for the Charles S.
Munson Memorial
National Distillers & Chemicals Corporation &
Subsidiary \$300,000 for The Presbyterian Hospi-
tal Endowment in honor of John E. Bierwirth
National Foundation—March of Dimes \$900,000
for the March of Dimes Center for Genetics, Nu-
trition and Human Development in memory of
Dr. Virginia Apgar
New York Life Insurance Company \$100,000 unre-
stricted
New York Orthopaedic Hospital Alumni Associa-
tion \$243,762 for Scholarship Endowment
Prudential Insurance Company of America \$200,000
for Columbia University Nursing Scholarship
Endowment
Charles E. Revson Foundation \$750,000 for an En-
dowed Professorship
Rockefeller Brothers Fund \$500,000 for Babies
Hospital
The Rockefeller Family \$570,000 for various pur-
poses
Mrs. John J. Schumann, Jr. \$135,000 for the Edward
S. Harkness Eye Institute
S. D. Securities, Inc. \$151,000 for the Edward S.
Harkness Eye Institute
Spingold Foundation \$100,000 for the Edward S.
Harkness Eye Institute
Mrs. Everett Stein \$500,000 for an Endowed Fel-
lowship in Advanced Studies, Columbia Univer-
sity
The Teagle Foundation \$223,600 for the Columbia
University School of Nursing
Marcia Brady Tucker Foundation \$119,000 for
Babies Hospital

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FOR MEDI/CENTER I

Union Carbide Corporation \$100,000 for various purposes

Mrs. Percy Uris \$715,000 for The Presbyterian Hospital Endowment

Estate of Jacques Weber \$250,000 for The Presbyterian Hospital

Westvaco Corporation \$150,000 for The Presbyterian Hospital and Columbia University

Mr. & Mrs. Robert Winthrop \$537,000 for The Presbyterian Hospital

Twenty-four Estates totalling \$6,217,661 for various purposes

Bureau of Health Manpower, U.S. Public Health Service, Dept. of Health, Education and Welfare \$666,747 for the School of Public Health

Division of Cancer Research Resources and Centers, National Cancer Institute, National Institutes of Health \$316,835 for Cancer Research Center Laboratories (2 grants)

Reports of Departments and Services

Anatomy

MICHAEL D. GERSHON

Professor and Chairman of the Department

The past year has been one without major change for the Department of Anatomy. Needs have expanded to fill all available space (a kind of Parkinson's Law of Departments) and what appeared commodious when we moved from the 10th to the 12th floor now looks quite full. The addition of two new faculty members and the actual or impending promotion of others has left us with no room to spare.

New appointments this year have included Drs. Richard Ambron and Marie-France Maylie-Pfenninger. Both are well trained in Cell Biology and are as comfortable with the biochemical aspects of cell function as with the structural. Dr. Ambron spent one year gaining expertise in teaching Gross Anatomy and now is quite accomplished at it. Dr. Maylie-Pfenninger will follow a similar course but in Histology and Developmental Anatomy. Joining our faculty ranks next year will be Drs. Cheryl Dreyfus and Taube Rothman, both in the area of Cellular and Developmental Anatomy. Dr. Alan Gintzler will be leaving.

Our seminars have continued to be an important part of our program, particularly the progress reports given by our own faculty. In the future, we hope that this program will appeal to everyone in the Department and serve to expose those whose interests remain oriented towards gross morphology to the exciting emerging concepts of Cell Biology, Developmental Anatomy and Neurobiology. These areas represent the advancing front of the field.

Teaching

The curriculum changed again this year. Histology

remained at about 100 hours but scheduling problems in the Hammer multidisciplinary space interfered with the smooth conduct of that course. Nevertheless the medical students did very well and the course was well received. The dental class did less well and a special effort will be made next year to accommodate the particular problems of the dental group. Developmental Anatomy was taught for the first time and, as might be expected for a course designed at the last minute after the curriculum change was adapted, was not without problems. However, these problems were well recognized by students and faculty and should be easily corrected next year. Many students commented on how much they learned in this area. In Gross Anatomy, the course has progressed, greatly aided by the efforts of the Department of Surgery. In this respect we are grateful for the organizational efforts of Dr. Alfred Jaretzki III. Dr. Ernest April was elected Teacher of the Year. Thus, for the second successive year that honor fell within our Department.

Research

Dr. Gershon's research has three major directions. One is to continue the investigation of the enteric nervous system. These studies encompass the characterization of enteric serotonergic neurons and also a new project in which the origin of neuronal diversity is under examination. A second direction is to relate the events of cell division to the development of defining characteristics by developing adrenergic neurons. The final direction is a study of the mechanisms involved in the establishment of connections

between neurons in the brain. The first area is Dr. Gershon's major effort. In all three areas of research he is collaborating with Drs. Taube Rothman and/or Cheryl Dreyfus.

Dr. Richard Ambron is continuing studies on the biosynthesis of membrane glycoproteins and their assembly into organelles within single identified neurons of *Aplysia californica*. The focus is on two glycoproteins in the giant neuron R2—one, an integral glycoprotein of the external membrane and the other, a component of synaptic vesicles. The structure of these two components is being investigated, as well as their fate within the neuron. Drs. Beverly Lubit and James Schwartz (Neurobiology) are isolating an antibody to the vesicle glycoprotein to confirm its intracellular location. Ariel Sherbany (graduate student) is collaborating with Dr. Ambron to examine the regional synthesis of membrane glycolipids and Steven Rayport (Graduate Student) is attempting to label the synapses of R2 by using specific radioactive compounds which are transported in the anterograde and retrograde direction along the axon. Polyamines have been implicated in the regulation of nucleic acid and protein synthesis and may mediate events at the external membrane. Dr. Ambron and Dr. Leon Kremzner (Neurology) are studying the synthesis and axonal transport of these compounds in single neurons.

Dr. Ambron was awarded a NIH grant for the study of glycoproteins in single neurons and a Career Development Award.

Dr. April's biophysical studies continue to support the hypothesis that the A-band of striated muscle is a liquid-crystalline structure. Low-angle X-ray diffraction studies, correlated with light microscopy, provide data from which the origins and magnitudes of the stabilizing forces within the lattice can be inferred. Studies on single muscle fibers from which the sarcolemmae have been removed have provided information in both the relaxed and rigor states on the role of Donnan osmotic forces in lattice stability. In conjunction with Mr. Robert Aldoroty, M.D./Ph.D. degree candidate in Anatomy, the role of polyvinylpyrrolidones as osmotic phase boundaries for skinned fibers is being investigated. Dr. April has presented his concepts of the liquid-crystalline aspects of striated muscle at the annual meetings of the Biophysical Society and the American Association of Anatomists.

Dr. Philip Brandt supervised Dr. Robert Cox, who successfully defended his Ph.D. Thesis on October 25, 1978. Currently, Dr. Brandt has a second-year medical student working with him several half-days a week.

Dr. Brandt's research is in muscle biophysics. He is particularly interested in the role of structural myofilament array in the biochemical and physiological parameters of the actomyosin ATPase system. This past year Dr. Brandt built an entirely automatic apparatus to collect the tension/calcium ion and tension/substrate data on single skinned rabbit psoas fibers. The apparatus accepts a coded sequence for the experiment. The muscle fiber is attached to the apparatus, and the solution is put at the appropriate pumping stations. The apparatus automatically performs the experiments, making judgments about when to change the solution, and punches the output data on paper tape. The tape is fed into a computer and the final data plots are printed out. About one week's data is collected each day, and the accuracy is very much improved.

Dr. Julia R. Currie's research is concerned with cell membrane differentiation in the developing nervous system. This work involves the use of lectin-ferritin conjugates to map ultrastructurally the specific carbohydrate groups on the outer surface of differentiating neural cells. Differences in sugar composition have been found on the apical surface of cells; from the dermectoderm, the neural crest ectoderm, and the neural tube ectoderm. During the process of neurulation, changes in sugar composition occur on the plasmalemma of these three ectodermal types.

Dr. Currie was awarded a NSF Grant for the period of 1978-1981.

Dr. Arline D. Deitch has collaborated with Drs. Paul Marks, George Maniatis, Richard Rifkind and their associates in studies on transformed erythroid cells, using agents which induce or inhibit differentiation. Among the changes followed by flow microfluorimetry and related techniques during the early course of induction were alterations in cell volume, cell cycle kinetics, cyclic nucleotide content and production of the specific erythroid protein spectrin.

Dr. Cheryl F. Dreyfus is interested and involved in two research projects. One project has as its ultimate object a determination of what factors influence the growth of central aminergic neurites to appropriate target sites and to the formation of specific functional connections. These studies are being carried out with a tissue culture model system involving co-cultures of fetal and hippocampal explants. It has already been demonstrated that adrenergic neurites growing from the mouse brainstem enter and functionally innervate hippocampal explants. The second project is involved with further understanding the biology of peripheral serotonergic neurons in the myenteric

plexus, the interrelationships these neurons, as well as others, exhibit to one another and finally the factors affecting development of neurons constituting the myenteric plexus.

Dr. Dreyfus has been elected to Sigma Xi. His research is supported by NIH grant, NS 12969 "Neural Control of Gastrointestinal Activity", awarded to Dr. Michael D. Gershon on which Dr. Dreyfus is co-investigator; NIH grant, NS 14990, "Development of Organotypic CNS Networks in Culture", awarded but pending to Dr. Stanley M. Crain, Albert Einstein College of Medicine, which will be subcontracted to Dr. Dreyfus as principal investigator at Columbia, P&S. In addition, Dr. Dreyfus was supported through July, 1978 by a Pharmacology-Morphology Fellowship granted by the Pharmaceutical Manufacturer's Association Foundation.

Dr. Abraham B. Eastwood was invited to lecture about his research at the Department of Anatomy, University of British Columbia, Vancouver, Canada. He reported results of his research at the annual meetings of the Biophysical Society, in Washington, D.C. (Eastwood et al., 1978a) and the Society for Cell Biology in San Antonio, Texas (Franzini-Armstrong et al., 1978). He is a member of the Biophysical Society, the Society for Cell Biology, the New York Society for Electron Microscopy, and the American Society for the Advancement of Science.

Dr. Eastwood is the director of the Laboratory of Muscle Morphology, a division of the H. Houston Merritt Clinical Center for Muscular Dystrophy and Related Diseases. He is in charge of ultrastructural pathology for the center. His research projects are: (a) In collaboration with Drs. John Reuben, Donald Wood and Ms. Katherine Bock (Neurology), the morphology of chemically skinned mammalian skeletal muscle fibers was studied and the results were presented (Eastwood et al., 1978a). (b) Structural and functional abnormalities in muscle from patients with Duchenne Dystrophy were studied. In muscle biopsies examined with the electron microscope, he found structural changes that may account for the weakness of single chemically skinned dystrophic fibers (Wood et al., 1978). (c) In collaboration with Dr. Martha Sorenson (Neurology) he studied the morphological localization of calcium taken up by the sarcoplasmic reticulum of chemically skinned mammalian muscle; this was reported briefly (Sorenson et al., 1978). (d) Using a Golgi silver impregnation technique to selectively stain the transverse tubular system (T system), he is studying the three-dimensional distribution of the T system in

normal and diseased human muscle with stereo pair micrographs taken with our 100 kV electron microscope and the 1000 kV high voltage electron microscope (HVEM) at Boulder, Colorado. (e) Using Golgi staining and stereo pair micrographs taken with 1000 kV electron microscopes and the HVEM in Boulder he studied the three dimensional distribution of the T system in several types of crustacean skeletal muscle fibers. This work was done in collaboration with Drs. Clara Franzini-Armstrong and Lee D. Peachey at the University of Pennsylvania (Franzini-Armstrong et al., 1978). (f) The distribution of thick and thin filaments was studied in a crustacean muscle which shortens to an unusual degree and in which the myofilaments are uniquely arranged. This work was in collaboration with Drs. Reuben and Wood (Eastwood et al., 1978).

Dr. Charles A. Ely has found that ovaries transplanted to the spleen of castrate thyroidectomized mice develop tumors of the same size and gross appearance as those in animals with intact thyroids. A microscopic comparison is in progress. Several antisera to purified sheep follicle-stimulating hormone have been found to vary greatly with respect to the presence of anti-luteinizing hormone activity, and, after removal of such activity by absorption with the appropriate hormone, several of these antisera have been studied for their effect on the normal female mouse. Vaginal cycles were not inhibited but there appeared to be a luteinizing effect. In medical gross anatomy and in anatomy for dental hygienists, Dr. Ely has made further observations on the preparation and use of prosected material. In addition, he has explored the systemic approach to teaching gross anatomy in an abbreviated course given in the summer session.

Dr. Susan C. Feldman's research is performed in collaboration with, and in the laboratory of Dr. Ann-Judith Silverman. In the past year Dr. Silverman and she have been concerned with demonstrating the distribution of somatostatin neurosecretory neurons in the adult mouse and rat brain, using immunocytochemistry. In both these species they have localized somatostatin neurosecretory neurons in most areas of the fore and mid-brain. In the mouse they have determined the location of large numbers of neurons which appear to be innervated by somatostatin-containing fibers. In routine immunocytochemistry, projections from somatostatin neurons are difficult to visualize except in regions of terminations. In order to determine the sites of projections of different groups of somatostatin neurons they are trying two approaches. The first involves the placement of discrete lesions in the brain; sections are

then stained and examined for deficits in somatostatin fibers. The second approach involves the use of thick, 50-100 μm , sections which are stained for somatostatin. This procedure should enable us to visualize more of the dendritic tree and enable us to trace somatostatin axons from their origin to their points of termination.

Dr. Alan R. Gintzler's major focus of research is to identify the anatomical and neurochemical basis for the acute inhibitory or analgesic effects of opiates and also the neuronal components that are involved in mediating the long term effects of narcotics, i.e., the development and manifestation of a state of tolerance and dependence. One major aspect of the scientific strategy is to use the isolated guinea-pig ileum as a model system on which to study the mechanism of action of narcotics. Currently, experiments are being conducted on adult ileum, developing or fetal intestine and intestine grown in organotypic tissue culture.

Dr. Daniel M. Linkie's research efforts have been directed at the characterization of the hormone receptor systems for the sex steroids (e.g. uterus, pituitary and hypothalamus of the rodent) wherein analysis of the kinetics of steroid-receptor binding, and translocation and transformation of the complex has provided insight into the mechanism(s) of hormone action. These intracellular events loom as possible phenomenological markers for steroid-protein-chromatin interaction in normal and diseased tissues. This work has been adjuncted by studies on the role of serum proteins, *in vivo*, in the binding of estrogen. More specifically, the serum-globulin, alpha₂-fetoprotein, which is of amniotic membrane and fetal hepatic origin, exerts a profound influence on the availability of estrogen to the tissues of the developing rodent during its fetal and neonatal stages. Progress has also been made in efforts to develop a tissue antigen localization scheme involving the estrogen receptors. This portends eventual identity of the hormone receptor at its native ultrastructural locus in the intact cell.

Dr. Melvin L. Moss's studies on the processes of adaptive cranial growth have expanded to include the cooperation of Prof. Richard Skalak, Director of the Bioengineering Institute. For the first time, the trajectories of anatomical points in space-time have been demonstrated and modelled, and these distinguished from material particle path motion in space. This significant conceptual break-through will be exploited fully by the techniques of mathematical analysis and computer graphics in the coming year.

Dr. Charles R. Noback taught the following courses this year: (1) Anatomy 102F—Human Anatomy, (2) H.P. M3101x—Human Anatomy OT/PT, (3) H.P. M3103x—Anatomy of the Nervous System (Neuroanatomy) OT/PT, (4) Postgraduate Review

Course in Neuroanatomy and Neurophysiology, (5) Postgraduate Review Course in Psychiatry and Neurology (Dept. Psychiatry) (6) D 99124—Postgraduate review course in dental gross anatomy.

Dr. Noback's efforts in the past year were concentrated in three areas: 1) Research is continuing on a study of protein-calorie undernutrition of rat pups reared by dams fed on a protein deficient diet during the suckling stage. Observations indicate (a) delayed myelination of certain tracts of the central nervous system myelinating during this early postnatal period, (b) most pyramidal cells examined in selected regions of the neocortex, hippocampus and dentate gyrus and Purkinje cells of the cerebellum in Golgi-Cox preparations of the pups of dams fed the deficient diet were essentially similar in their primary dendritic patterns as those of pups of dams reared on a normal diet and (c) the number of spines per unit length of dendrites were slightly less in these cells in the pups of dams fed on the protein deficient diet. These observations suggest that development of spines may be modified during protein deficiency. 2) Editorial work was finished on a book edited by him—"Sensory Systems of Primates", (see bibliography). 3) Commenced a revision of his textbook, "The Human Nervous System".

Dr. Eladio Nunez' research objectives continue to be the elucidation of essential characteristics of parafollicular cells of the mammalian thyroid gland and to define as fully as possible how these cells interact with thyroid follicular cells as well as with parathyroid chief cells. His research activities were funded by a NIH Research Grant.

The research activities in Dr. Karl H. Pfenninger's laboratory continued to be focussed on neuronal growth and differentiation, especially on the problems of membrane biogenesis and of cell surface specificity in neuronal recognition. The laboratory personnel now consists of nine people besides the principal investigator: Julia R. Currie, Ph.D., Research Associate; Rochelle Small, Ph.D., and Ira Wallis, Ph.D., postdoctoral fellows; Philip Simkowitz, graduate student; Rose Cesar, Tatia Harding, Marian Johnson, Linda Siegel and Myra White, Supporting Staff.

The research can be summarized as follows:

1. Membrane biogenesis (KHP); the appearance of new lectin binding sites in specific zones of the growing plasma membrane of the neurite have been demonstrated unambiguously. These growth zones are cytoplasmic protrusions which contain clusters of vesicles, the plasmalemmal precursor membrane. Autoradiographic tracing of the intracellular pathways of these vesicles and their isolation by density gradient centrifugation are now in progress.

2. Membrane differentiation: This problem is studied in two systems, the regenerating olfactory nerve of the bullfrog and synaptogenesis *in vitro*. Rochelle Small has now demonstrated the stepwise appearance of different classes of intramembranous particles in the axolemma of the developing nerve and will try to correlate this morphological maturation with changes in function. Philip Simkowitz found that, during synaptogenesis, the membrane of the developing nerve terminal changes its lectin binding properties, i.e., its glycoconjugate composition, in response to target contact. Synaptic membrane differentiation will be investigated further with modern biochemical and immunological techniques by Ira Wallis.

3. Surface specificity of the neuron: Karl H. Pfenninger completed the catalogue of lectin binding properties of different neurons. Each neuronal type was found to exhibit a specific carbohydrate signature on its surface. This may be of crucial importance to mechanisms of cellular recognition. Furthermore, it has been established that neural tube- and crest-derived neurons fall into separate classes of lectin binding properties. Julia R. Currie is investigating the origin of this dichotomy by studying lectin binding of ectoderm during neurulation. She found that differences in surface properties between surface ectodermal, crest, and future tube cells can already be detected very early, when the neural groove has just been formed.

Some of this material has been presented in four contributions at the annual meeting of the American Society for Cell Biology in San Antonio (November 1978). Furthermore, KHP presented results of these studies as an invited speaker at a symposium during the annual meeting of the Society for Neurochemistry (March 1978), in Washington, D.C., and as a main speaker at an international symposium on "Development and Chemical Specificity of Neurons" in Davos, Switzerland (September 1978). KHP gave research seminars at the IBM Research Center, Yorktown Heights, New York, to the Philadelphia EM Society, at the Kennedy Center of Albert Einstein College of Medicine, and at the Department of Cell Biology of New York University. Courses on special techniques utilized in this laboratory were presented by KHP at the Cell Science Center, Lake Placid, New York, and at the Cold Spring Harbor Laboratory, Long Island.

Dr. Pfenninger is director of a new course in Developmental Anatomy where he gave several lectures. He is also lecturing in Microscopic Anatomy.

During the past year the research program of Dr. John J. Rasweiler IV continued to be concerned with the development of selected species of bats as exper-

imental models in mammalian reproductive research.

Dr. Taube P. Rothman was awarded a Basil O'Connor starter grant, National Foundation March of Dimes. Dr. Rothman's major area of research is in the investigation of the ontogenetic development of peripheral neurons. Until recently it was thought that, like CNS neuronal precursors, these neural crest derivatives withdraw from the cell cycle before exhibiting their specific neuronal transmitter cell type. However, recently she has shown that a population of peripheral sympatheticoblasts continue to cycle even after they synthesize and acquire their catecholamine content. The ontogenetic parameters which ultimately control withdrawal of peripheral neural precursors from the mitotic cycle, particularly those that store and utilize norepinephrine are presently being investigated.

In addition it is known that the kind of neurotransmitter which neurons derived from the neural crest utilize is dependent upon the microenvironment in the tissues they occupy after they complete their migration from the neuraxis to the periphery. Understanding the role played by the definitive microenvironment in determining neurotransmitter type is also being investigated. Several types of intrinsic neurons exist in the enteric plexuses of the gut. These neurons are thought to be derived from neural crest. Proof that they [particularly those which utilize serotonin (5-hydroxytryptamine), the peptides (substance P, VIP, somatostatin and acetylcholine)] are derived from the neural crest but are dependent upon the enteric microenvironment for acquisition of their specific transmitter type is being studied. Normal mice and those which are homozygous for aganglionic megacolon, with anomalies of either the neural crest or the enteric microenvironment or both are being utilized in these studies.

Dr. Ann-Judith Silverman's research centers around peptidergic neurosecretory systems in the mammalian brain. Her major projects include: a) neuroanatomy of luteinizing hormone-releasing hormone neuronal networks and their relationship to regulation of tonic and cyclic gonadotropin secretion; b) ontogeny of LHRH neuronal networks with specific focus on sexual dimorphism and the role of fetal testosterone secretion on their development; c) the differentiation of vasopressin secreting cells concentrating on the time of synthesis and how it correlates with withdrawal from the mitotic cycle; migration of neuroblast from ependymal lining and formation of synaptic input to supraoptic neurons; and d) the role of the vasopressin neurons of the paraventricular nucleus in the regulation of ACTH secretion.

Dr. Silverman was awarded the Irma T. Hirsch Career Scientist Award in January, 1978.

Dr. Virginia M. Tennyson is continuing her investigations on the effects of reserpine on the nervous system of pregnant rabbits and their fetuses. Dr. Tennyson and her colleagues have found that chronic reserpine administration to the dam causes lesions in her brain and also in the putamen of her fetuses. Counts of axonal terminals in electron micrographs indicate that there are fewer terminals in the putamen of reserpine-treated fetuses than in controls, suggesting that this drug may have interfered with the proper growth of dopamine-containing axons. A paper covering this formation was presented at the Anatomy meetings in Vancouver, 1978. Dr. Tennyson was invited to give this lecture of the VI International Parkinson's Disease Symposium in Quebec, September 1978.

In collaboration with Drs. Miranda and Hays, she is studying selected human muscle diseases by elec-

tron microscopy. They are particularly interested in determining whether abnormalities found in the biopsy are also found when parts of the biopsy are grown in tissue culture. Finding abnormalities in both the original biopsy and in cultures grown from it would suggest that the disease is of muscle origin rather than secondary to nerve pathology.

Our studies on polyamine metabolism in normal, denervated and dystrophic muscle have been published.

Grants from NIH were awarded to Dr. Tennyson and to Dr. Lewis Rowland, which is a center grant of which Dr. Tennyson is a part. Also Dr. Tennyson is a part of Dr. Rowland's Muscular Dystrophy center grant. Dr. Tennyson has a grant from the United Cerebral Palsy Association, and some general support from the Parkinson's Disease Foundation.

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Anesthesiology

HENRIK H. BENDIXEN

Professor and Chairman of the Department • Director of Service

The Department of Anesthesiology continues to make progress in attracting fine applicants for both the training program and for faculty positions. Our residency training program has been increasingly effective, but we continue our efforts to find additional ways of strengthening the program. The efforts continue to improve and broaden our clinical services. Our research activities are undergoing a complete re-evaluation in order to prepare ourselves for the research funding realities of the coming decade.

In the Department's administration Dr. Shih-Hsun Ngai continues to be responsible for research and research training, Dr. Eugene J. Pantuck for direction of training and teaching activities and Dr. Donald C. Brody for coordination of clinical activities of the Service at the Presbyterian Hospital. Dr. Edgar C. Hanks is the elected Treasurer and Dr. Jacob S. Israel the elected Secretary of the Department. Dr. Mieczyslaw Finster is the elected Chairman of the Management Committee of the Service at the Presbyterian Hospital. Dr. Kevin Sanborn is responsible for medical student teaching and Dr. Marcelle Willock coordinates training in cardiopulmonary resuscitation.

Training and Teaching

The recruitment process provides the residency training program with ever better applicants, placing us once again among the leading programs in the country. We continue to review our didactic programs and clinical rotations with a view towards further strengthening of the programs. We also partic-

ipate in inservice evaluations and in-training examinations given under the auspices of the American Board of Anesthesiology.

In our approach to clinical service, we emphasize that our residents are trained to head anesthetic teams, not just to perform solo practice. As part of the team concept, one concern is for the rational use of all appropriate manpower categories. At the Presbyterian Hospital we have incorporated certified nurse anesthetists and monitoring technicians in our anesthetic teams, headed by physician anesthesiologists. We continue to emphasize the management of the critically ill patient, not only in the operating room, but also in intensive care units and recovery rooms.

We continue to participate in medical student preceptorship programs of the American Society of Anesthesiologists. We also welcome surgical and oral surgical house staff on rotation through the Anesthesiology Service at the Presbyterian Hospital. We offer such rotations on an elective basis to members of all services.

The clinical clerkship in anesthesiology for third year medical students has been extensively reorganized by Dr. Sanborn who gets credit for the significant improvement achieved. Students now have increased opportunity for clinical experience in the operating rooms and the didactic teaching has been strengthened.

The Department is offering training in cardiopulmonary resuscitation, according to the standards of the American Heart Association, to medical students and to members of the Presbyterian Hospital staff. By

passing a written and practical examination the participating individual may be certified by the American Heart Association in basic life support. These activities are being coordinated by Dr. Willock.

The Department offers a weekly lecture series which has been designated a continuing education activity, meeting all the requirements for credit in Category I towards the Physicians Recognition Award of the American Medical Association. Similarly, our Tuesday seminar series has been modified in content and format, and is also approved as a continuing medical education course for credit in Category I.

Our residency training program continues to offer a continuum of four years of training, starting with the first year out of medical school, made possible by cooperation with the Overlook Hospital in New Jersey, one of our affiliated hospitals, where the first graduate year level of training is provided.

Research and Research Training

During the past year we have continued to have the support of the National Institute of General Medical Sciences for most of our research and research training activities. However, the Anesthesiology Center Grant will not be renewed, and we expect to support our research efforts largely through individual project grants and other resources.

We have also had research support from the following sources: The American Lung Association, the Whitehall Foundation, the J. M. Foundation, the Pennwalt Corporation, the Doll Foundation, the Westchester Heart Association, the Mary Harriman Foundation and Hoffmann-La Roche, Inc.

We continue to enjoy collaboration with other departments and other institutions, including the Departments of Pediatrics, Pharmacology, Physiology, Psychiatry, Ophthalmology, Medicine, Surgery, and Obstetrics and Gynecology as well as the Roche Laboratories, the Roche Institute of Molecular Biology, the Laboratory of Preclinical Pharmacology at the National Institute of Mental Health, the Rockefeller University and the Astra Pharmaceutical Products.

Drs. Ngai and A. Donald Finck, collaborating with Drs. K. Nishitaten and B. A. Berkowitz (Roche Institute of Molecular Biology) completed their studies on the pharmacokinetics of morphine. The effects of hypocarbia on the distribution and elimination of morphine have been studied in dogs, showing that hypocarbia significantly increases morphine concentration in the cerebral cortex throughout the period of observation. The same investigators, working with Drs. Maureen Kantzler and Jerome Jaffe of the New York State Psychiatric Institute have

studied the behavioral effects of nitrous oxide in man. In collaboration with Dr. D. L. Cheney of the Laboratory of Preclinical Pharmacology at the National Institute of Mental Health the same investigators have studied the effects of lidocaine and cocaine on behavior and acetylcholine turnover rates in brain structures in rats. Sedation induced by lidocaine is associated with a decrease in acetylcholine turnover rate in the cerebral cortex. Cocaine markedly increases motility together with sympathomimetic manifestations and increased acetylcholine turnover rate in the cerebral cortex.

Dr. Finck, working with Drs. Ngai and Berkowitz, continues to investigate the pharmacology of nitrous oxide as an analgesic and on endorphin concentrations in the brain.

Dr. Joseph C. S. Yang is collaborating with Dr. W. Crawford Clark (Psychiatry) in quantifying clinical and experimental pain. Dr. Yang is also studying the analgesic action of nitrous oxide in man and its possible antagonism by naloxone.

Drs. Lubos Triner, Yvonne Vulliemoz, Yakub Gangat, Sook-Young Woo and Keith Bernstein and Mariagnes Verosky, Research Associate, have continued their investigation of the mechanism of action of volatile anesthetics on the cAMP system in myocardium and in different areas of the brain. The interaction of halothane with calcium and drugs known to act on the cAMP system through calcium mediation is being explored in order to clarify the mode of halothane action on the enzyme adenylate cyclase. In related studies the myocardial adenylate cyclase-cAMP system and its responsiveness to beta-adrenergic agonists and antagonists have been continued in collaboration with Drs. Brian Hoffman, Michael Rosen and Peter Danilo (Pharmacology). The same investigators are also working with Dr. Kenneth E. Eakins (Ophthalmology) on a prostaglandin inhibitor. Dr. Keith Bernstein is concentrating on a study of the effect of halothane on binding of agonists to beta-adrenergic receptors in canine myocardium.

Dr. Richard S. Matteo, in collaboration with Drs. Nishitaten, Richelle DeGuzman and Hoshang J. Khambatta, has studied the pharmacokinetics of the non-depolarizing muscle relaxants in man. The same investigators, working with Drs. Ronald E. Miller, Jay Ham and Lewis Sheiner of the Department of Anesthesia, University of California, San Francisco, have studied the effect of different dosage schedules of curare in anesthetized patients. The spontaneous recovery rate or antagonism of neuromuscular blockade were not significantly different with different dosage schedules, suggesting that past claims of a pharmacokinetic advantage of a large initial bolus of

curare may well be incorrect. Their work on the pharmacokinetics of metocurine and d-tubocurarine in adults, neonates, infants and children continues. Dr. John T. Herbert has been assisting Dr. Matteo in the studies of metocurarine pharmacokinetics in patients with biliary obstruction and in end stage renal distress.

Dr. Pantuck continues to collaborate with Dr. Allan H. Conney of the Roche Laboratories in studies of the role of environmental factors in the regulation of drug and carcinogen metabolism and on the role of extrahepatic metabolism in determining the bioavailability of drugs.

Dr. Leila Mei Pang continues to work with Drs. Robert B. Mellins and S. Alex Stalcup (Pediatrics) on the effects of hypoxia and bradykinin on pulmonary lymph fluid and protein flow; and on the effects of exogenous corticosteroids on converting enzyme activity in the lungs of premature rabbits. In collaboration with Drs. Mellins, Stalcup, Richard B. Silver and Constance J. Hayes (Pediatrics) and Frederick O. Bowman (Surgery) Dr. Pang is also studying the activation of kallikrein in children during profound hyperthermia for corrective cardiac surgery.

The Perinatology Research Group, headed by Dr. L. Stanley James, continues to constitute one of our major research efforts. The group has continued their investigation of fetal monitoring and Drs. James and Stark (Pediatrics) and Mr. Henry Rey (Obstetrics and Gynecology) continue to improve the fetal monitoring scoring system which has led to important observations on fetal cardiovascular responses to the stresses of labor. The data management system has been designed to provide on-line evaluation of risk factors associated with pregnancy, labor and delivery. The group has developed a preliminary statistical model for prediction of birth asphyxia and have shown an overall prediction accuracy in excess of 90%. They have identified the 14 variables most predictive of birth asphyxia, greatly simplifying the clinical application of the model.

Drs. Salha Daniel, Stark, Hisayo O. Morishima and James have continued to study the role of the fetal kidney in homeostasis during intrauterine life, labor and the immediate postnatal period. The studies to date suggest that some of the vasoactive mediators produced by the fetal pituitary and adrenosympathetic systems and possibly the renin angiotensin system, during normal gestation and labor, are involved in the control and perhaps the maturation of renal function. Birth asphyxia could result in marked disturbances in neonatal adaptation, abnormal renal function and even structural damage to the kidney.

Dr. Morishima, working with Drs. James, K. Sakuma (Visiting Fellow, Pediatrics), Samuel L.

Bruce (Obstetrics and Gynecology) and James L. Perel (Psychiatry) have continued an investigation on the effect of maternal apprehension and pain on the fetus, using pregnant baboons and sheep. Both stresses have been found to increase maternal plasma catecholamine levels and to cause a decrease in utero-placental blood flow. Drs. Morishima, Finster, Hilda Pedersen and B. J. Covino (of the Astra Research Laboratory in Framingham, Mass.) continue their study of local anesthetic toxicity in fetal, newborn and adult sheep. The same investigators are also studying the pharmacokinetics and renal excretion of local anesthetics in the fetal lamb. Drs. Pedersen and Finster, working with Dr. Matteo, have continued their study of the placental transfer of clinically used doses of d-tubocurarine during elective cesarean sections.

Dr. Jen-Tien Wung has been working with Dr. Karl Schulze (Pediatrics) on changes in oxygen consumption in the neonate with the respiratory distress syndrome under the influence of various forms of treatment. Dr. Wung is also studying the feasibility of transcutaneous oxygen partial pressure measurements as a monitoring method to prevent retrolental fibroplasia.

Dr. Gabriel G. Nahas has been working with Drs. Wylie Hembree and Hosea Huang (Obstetrics and Gynecology) to study different cannabinoids and their effects on the reproductive function of rodents. This study indicates that cannabinoids have a direct depressive effect on the germinal epithelium of the testis as well as an effect on gonadotropins from the pituitary. These same investigators, working with Dr. Elliott Osserman (Medicine) have studied the immunoglobulins of a group of young marijuana smokers compared with normal individuals and found the globulin to be significantly lower in the marijuana smokers. Dr. Nahas has also worked with Drs. Bernard Desoize and Jacques Banchereau in a study of the mechanism of inhibition of DNA synthesis by psychotropic drugs. With Dr. Akira Morishima (Pediatrics) Dr. Nahas has carried out studies of the hypoploid metaphases in cultured lymphocytes from marijuana smokers.

Dr. J. Gilbert Stone has been working with Drs. Alber Faltas, Carolyn Greenberg, Joseph Buda (Surgery) Leslie Baer (Medicine) and Khambatta in studies of the biochemical control of circulatory homeostasis during anesthesia, with a special interest in plasma renin activity. Another major research interest has been the use of vasoactive drugs in the control of the circulatory preload and afterload. Dr. Stone has cooperated with Dr. Khambatta in the study of hypotensive anesthesia; and Dr. Khambatta has completed a study of the effects of propranolol on

oxygen transport during hypoxia. In association with Dr. Matteo, Dr. Khambatta has also engaged in the study of pharmacokinetics of metocurine in man.

Dr. Ralph A. Epstein, working with Drs. Mellins, J. J. Haddad (Pediatrics), Mary A. Epstein (Chemical Engineering) and Warren K. Grodin have continued the collaborative study of the developmental aspects of cardiorespiratory control, studying normal infants and infants with a history of episodes suggestive of aborted sudden infant death syndrome. Studies to date have found differences in the development of control mechanisms in the two groups and work in experimental animals has been started in order to clarify the mechanism involved. Drs. Jeffrey Askanazi, Allen Hyman, Stanley Rosenbaum and John Kinney (Surgery) have been studying breathing patterns and gas exchange in normal subjects and in nutritionally depleted patients who require total parenteral nutrition. The metabolic rate and CO_2 production has been found to increase in patients on total parenteral nutrition to the extent of being a possible cause of respiratory distress.

Drs. Richard Chen and Foun-Chung Fan have been working with Dr. Shu Chien (Physiology) on studies of hemodilution and hemoconcentration affecting regional hemodynamics and oxygen transport.

Drs. Stephanie Duberman and Henrik H. Bendixen have undertaken studies of the epidemiology of anesthetic accidents and adverse events.

Honors

Dr. Bendixen was invited to lecture to a meeting of the Yugoslavian Society of Anesthesiologists in Ljubljana, Yugoslavia; and to the Department of Anaesthetics at the University of Oxford, England. He also chaired a symposium on anesthesia for cardiovascular surgery at the European Congress of Anaesthesiology in Paris, France.

Dr. Louis S. Blancato, Director of the Anesthesiology Service at St. Luke's Hospital, continues as treasurer of the American Society of Anesthesiologists and also serves on several committees. He has been appointed a member of the Committee on Maternal and Child Health of the Medical Society of the State of New York and to the Professional Medical Liability Insurance and Defense Board. Dr. Ennio Gallozzi, Assistant Director of the Department at St. Luke's Hospital, serves on the Grievance Committee of the New York County Medical Society.

Dr. Herbert G. Cave, Director of the Anesthesiology Service at Harlem Hospital, is a Commissioner of the Mt. Vernon Board of Ethics, a member of the Mt. Vernon Economic Development Council and

Chairman of the Board of Directors of the Westchester Community Opportunity Program.

Dr. William Karl continues as Director of the Anesthesiology Service at Mary Imogene Bassett Hospital and continues as the Director and Vice President of the area PSRO.

Dr. Ronald Andree, Director of the Anesthesiology Service at Roosevelt Hospital, continues as Medical Director of the program of respiratory therapy at the Borough of Manhattan Community College. He also remains a member of the New York State Medical Society Professional Liability and Defense Board.

Dr. Demetrios Kalas, Director of the Anesthesiology Service at Overlook Hospital, is a member of the Executive Committee of the Surgery Department and a member of the Operating Room and Library Committees at that institution. Dr. Henry A. Connolly, Jr. served as Program Chairman of the New Jersey Society of Anesthesiologists and lectured on local anesthesia for eye surgery at St. Barnabas Hospital in New Jersey.

Dr. Ngai served as Visiting Professor at the University of California at Los Angeles and at the University of Miami. He has been appointed a Consultant to the Division of Research Grants of the National Institutes of Health and he continues on the Editorial Advisory Board of *Neuropharmacology*. Dr. Ngai received the Achievement Award for 1978 from the American Chinese Medical Society.

Dr. Leonard Brand has been elected to the Columbia University Senate. He also serves as a Consultant in Anesthesiology to the Veterans Administration Hospital in East Orange, New Jersey and he is a member of the New York State Society of Anesthesiologists Committees on Membership and Credentials.

Dr. Lester C. Mark is a member of the Executive Committee of the Foundation of Thanatology and he was Program Chairman of the Sixth Seminar and Workshop in Acupuncture held in New York City in September, 1978.

Dr. Finck was invited lecturer at the Annual Refresher Course given by the American Society of Anesthesiologists and he was also invited to lecture to the Department of Anaesthesia at the Massachusetts General Hospital in Boston.

Dr. Matteo has been appointed to the Scientific Advisory Board of the Association of University Anaesthetists.

Dr. Pantuck has been appointed to the Subcommittee on Current Research of the Committee on Annual Sessions of the New York State Society of Anesthesiologists and to the Subcommittee on Medical Students and to the Medical Student Preceptorship

Program of the American Society of Anesthesiologists.

Dr. Pang lectured at a joint session of the New York Academy of Medicine's Sections on Anesthesiology and Resuscitation and the New York State Society of Anesthesiologists. She is a member of the American Thoracic Society/American Lung Association Component Committee on research review and the American Thoracic Society Program Committee of the Scientific Assembly on Pediatrics.

Dr. James was Chairman of the Committee on Infant Mortality, New York State Medical Society and Chairman of the Sub-Board, Neonatal Perinatal Medicine of the American Board of Pediatrics. He was a consultant at the University of Benin, Nigeria and gave a series of lectures and seminars there on topics of perinatal physiology and care of the newborn. He also gave the 2nd Annual L. Emmett Holt, Jr. Memorial Lecture at New York University and organized and conducted a workshop for the National Institutes of Health on perinatal hypoxia, antecedents, mechanism and consequences.

Dr. Finster was appointed a member of the Obstetric Advisory Committee to the Commissioner of Health of the City of New York. He continues to serve as a member of the Subcommittee on Obstetrical Anesthesia of the American Society of Anesthesiologists. He has lectured at the Joint Meeting in Obstetrics and Gynecology in Israel and at the meeting of the Obstetric Anaesthetists Association in Edinburgh. He chaired a session on obstetrical anesthesia at the Fifth European Congress of Anesthesiology in Paris.

Dr. Wung was a visiting professor at the Taipei Medical College in Taipei, Taiwan.

Dr. Nahas participated in the work of the United Nations Commission on Narcotics in Geneva, Switzerland and has lectured at several universities here and abroad on various topics. He presented papers at the French Physiology Society's meeting in Toulouse, France, at the European Congress of Anaesthesiology in Paris, France, and participated in symposia in Reims, France and in Barcelona, Spain.

Dr. Hyman has been appointed Chairman of the Subcommittee on Respiration of the American Society of Anesthesiologists and was invited to lecture at the Dripps Memorial Conference at the University of Pennsylvania.

Dr. Ernest Salanitro lectured at the Harvard Medical School and to the American Society of Extracorporeal Technology.

Dr. Vance Lauderdale, Jr. has been elected Chairman of the Executive Committee of Peer Review of the Medical Society of the County of New York.

Dr. Gerald Weinberger is Secretary and member of the Executive Committee of the New York State Society of Anesthesiologists where he is also the Chairman of the Committee on By-laws and Rules and Business Manager for the Postgraduate Assembly. He is an Alternate Representative to the Medical Society of the State of New York. He is a Delegate to the American Society of Anesthesiologists and he serves also as a member of the Grievance Committee of the Peer Review Committee and the Committee on Continuing Medical Education of the Medical Society of the County of New York.

Dr. Marcelle Willock is the Elected Vice-Chairman of the Regional Emergency Medical Services Council of New York City. She is the Chairman of the Training Committee of the same Regional Council and is active in the establishment of training courses in cardiopulmonary resuscitation. Dr. Willock is also the President of District II of the New York State Society of Anesthesiologists.

Dr. Jacob Israel serves on several committees of the American Society of Anesthesiologists, among them the Respiratory Therapy Committee and the Joint Review Committee for Respiratory Therapy Education. He has also been a Chairman of the Anesthesia Care Team Education and a Recovery Room Workshop. In addition he is a member of the Program Committee of the Postgraduate Assembly of the New York State Society of Anesthesiologists and a co-editor of the publication of that organization.

Dr. John Holzer has lectured to the Medical Society of New Jersey, the New Jersey State Society of Anesthesiologists and the Annual Meeting of the American Society of Anesthesiologists.

Patient Care

The Presbyterian Hospital

The Anesthesiology Service attended 21,431 patients in 1978. General anesthesia was administered to 16,590 patients and regional anesthesia to 1,931. Consultations for resuscitation, diagnostic and therapeutic nerve blocks and respiratory care were provided for inpatients and outpatients. The Service continues the joint operation with the Department of Surgery of the Surgery/Anesthesiology Intensive Care Unit. During the year, 520 patients were treated in this unit.

The Respiratory Therapy Service treated 12,108 patients in 1978; 1,768 patients received mechanical ventilation for a total of 6,657 patient days.

Harlem Hospital

The Anesthesiology Service attended 6,147 patients in 1978. General anesthesia was administered

to 2,725 patients and regional anesthesia to 3,422. Consultations for resuscitation, diagnostic and therapeutic nerve blocks and inhalation therapy service and respiratory care were provided for inpatients and outpatients. The School for Training of Nurse Anesthetists continues to function successfully.

The Roosevelt Hospital

In 1978 9,420 patients were attended. General anesthesia was administered to 7,530 patients and regional anesthesia to 485. Consultations for resuscitation, diagnostic and therapeutic nerve blocks and respiratory care were provided for inpatients and outpatients.

St. Luke's Hospital

The service attended 10,260 patients in 1978. General anesthesia was administered to 9,582 patients and regional anesthesia to 678. Consultations

for resuscitation, diagnostic and therapeutic nerve blocks and respiratory care were provided for inpatients and outpatients.

Mary Imogene Bassett Hospital

1,742 patients were attended by the Anesthesiology Service. General anesthesia was administered to 1,358 patients and regional anesthesia to 384. Consultations for resuscitation, diagnostic and therapeutic nerve blocks and respiratory care were provided for inpatients and outpatients.

Overlook Hospital

The Anesthesiology Service attended 12,000 patients in 1978. General anesthesia was administered to 9,852 patients and regional anesthesia to 2,148. Consultations for resuscitation, diagnostic and therapeutic nerve blocks and respiratory care were provided for inpatients and outpatients.

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Biochemistry

ISIDORE S. EDELMAN

Robert Wood Johnson Jr. Professor and Chairman of the Department

Isidore S. Edelman, M.D. was appointed the Robert Wood Johnson, Jr. Professor of Biochemistry and Chairman of the Department commencing June 1, 1978. This is the first named Professorship in the Department of Biochemistry; it was made possible by a gift from the Robert Wood Johnson Charitable Trust. Dr. Edelman came to Columbia from the University of California, San Francisco, where he was the Samuel Neider Research Professor of Medicine. Laboratory facilities for Dr. Edelman and his research group have been completed. This laboratory has been named the Hans T. Clarke Biochemical Laboratory in honor of the late Professor Clarke, who was Chairman of this Department from 1928-1956.

The Department was awarded a new training grant in Steroid Hormones; Biochemistry and Molecular Biology with Professor Edelman as principal investigator and includes other members of the Department.

Research

Dr. Richard Axel's laboratory has been concerned with the organization of specific genes in the chromosome with the ultimate goal of understanding the mechanism responsible for the expression of these genes. They have adopted numerous approaches to accomplish these goals: a) They are examining the structure of specific cellular and viral genes in chromatin in order to discern those structural changes which occur within the chromatin complex and which accompany transcriptional activation. b) The primary sequence of specific eukaryotic genes can now be

examined, either by molecular cloning to obtain isolated genes or by more indirect approaches using restriction endonuclease mapping in unfractionated genomic DNA. They are currently analyzing the contribution of the primary sequence organization about the ovalbumin gene in regulating its expression in response to hormone. c) They have stably transformed mammalian cells with viral and cellular genes coding for selectable biochemical markers including thymidine kinase, adenine phosphoribosyltransferase, and dihydrofolate reductase. The ability to transfer purified genes provides the unique opportunity to study the functional and physical state of exogenous genes in a transformed host; this transformation is currently being developed to provide: 1) a means for gene purification; 2) a bioassay for the structure and function of purified genes; and 3) a tool for dissection of complex phenotypes.

The laboratory of Drs. Reinhold and Ruth Benesch developed a new micromethod for measuring the minimum gelling concentration of sickle hemoglobin which uses the sudden decrease in oxygen affinity when gelling occurs. This method which requires extremely small samples has also proved to be a valuable tool for screening of anti-sickling drugs. They also showed that the so-called sickle-sparing effect of hemoglobins which occur together with HbS in the heterozygous state, can be adequately accounted for by the "excluded volume" effect, since isolated α and β chains and myoglobin were found to have the same sickle-sparing effect of intact HbA. In addition, it was shown that a hemoglobin consisting

of one HbA dimer and one HbS dimer (stabilized by the specific crosslink developed in this laboratory) can also gel although at a higher concentration than the corresponding crosslinked HbS. Other efforts have included further studies on double mutants which contain α chain mutations in addition to the usual $\beta 6$ mutation and the discovery of hemoglobin mutants other than sickle hemoglobin which show a tendency to polymerize. Mr. Rohinton Edalji and Ms. Suzanna Kwong participated in these projects.

The Hans T. Clarke Laboratory, opened on August 1, 1978, now houses the research activities of Drs. I.S. Edelman, Fred Polsky and Marsha Reichman. Three main problems are under study; purification of steroid receptors, cell and molecular biology of thyroidal regulation of active Na^+ transport, and the regulation of apical membrane Na^+ permeability by aldosterone. These problems all concern hormonal regulation of membrane transport processes. Purification of glucocorticoid receptors is being attempted by combining DNA-cellulose chromatography and antibody affinity chromatography. The generation of antibodies is being explored by the hybridoma (fusion of immunized mouse spleen cells with mouse myeloma cells) technique. Cell biology of thyroid hormone action is under study in three isolated cell systems (myoblasts, fibroblasts, and proximal renal tubular fragments). In addition, isolation and purification of the mRNA's coding for the subunits of the Na^+ pump is being pursued as an approach to the role of induction of these mRNA's in the action of thyroid hormone. Analysis of aldosterone regulation of apical Na^+ permeability centers on covalent labeling (^{125}I) of the apex of toad bladder epithelium, purification of this membrane, and resolution of the constituent proteins by two-dimensional gel electrophoresis.

Dr. Max Eisenberg and Om Prakash are continuing their studies on the regulation of the biotin operon which is divergently transcribed. The repressor protein has been partially purified and shows a molecular weight of 45,000. Filter-binding studies with the partially purified repressor protein suggest that biotin-AMP rather than biotin may be the actual corepressor. Synthetic biotin-AMP is more effective than biotin in this assay. Studies with the biotin analog α -dehydrobiotin indicate that the coupled transcription-translation from the two strands of the operon may not be coordinate.

Dr. Philip Feigelson and colleagues have continued their investigations on the biochemical mechanisms underlying the hormonal and developmental control of specific hepatic mRNA species. They demonstrated that the appearance of hepatic tryptophan oxygenase in newborn animals is directly cor-

related with the appearance of tryptophan oxygenase mRNA. Administration of inducing doses of glucocorticoid to young animals results in the precocious induction of hepatic tryptophan oxygenase mRNA and concurrent synthesis of this enzyme. Further studies have been made exploring the biochemical mechanisms underlying the multihormonal control of the hepatic synthesis of α_{2u} globulin. It was found that thyroid hormones, androgens and glucocorticoids administered *in vivo* induce elevated levels of the specific hepatic mRNA which codes for α_{2u} globulin. Growth hormone has been found to control the rate of α_{2u} globulin synthesis by determining the efficiency by which pre-existing α_{2u} globulin mRNA is translated *in vivo*. A hepatocyte system has been developed which is capable of synthesizing α_{2u} globulin *in vitro* at an approximately linear rate for over 24 hours *in vitro*. Addition of glucocorticoids to hepatocytes *in vitro* results in the induction of elevated levels of α_{2u} globulin mRNA which is accompanied by a parallel elevation in the rate of biosynthesis of this protein.

Dr. Allen M. Gold continues his work on the interactions between glycogen, a highly branched animal starch, and enzymes that act directly upon it. Studies on glycogen synthase are continuing and a program of investigating the isolation and properties of glycogen branching enzyme has begun. Dr. Carola Ponzetto-Zimmerman, on leave from the University of Turin, has joined the laboratory and will collaborate on problems concerning the structure of glycogen particles.

Dr. Dezider Grunberger and his co-workers have continued in their studies on structural and conformational changes in nucleic acids modified by chemical carcinogens. The conformational properties of dinucleotides modified with the reactive derivative of benzo (a)pyrene were investigated by utilization of circular dichroism spectroscopy. This made it possible to propose a novel conformation for the modified oligonucleotides. Dr. Ray E. Jones, with Dr. Dezider Grunberger, has synthesized in a cell-free system and characterized the immunoreactive 31,000 molecular weight precursor to mouse polypeptide hormone, corticotropin, by using a messenger RNA which was isolated from a mouse pituitary tumor and was approximately 1250 nucleotides long. In a study with Robert G. Pergolizzi and Dr. Dean Englehardt on the biosynthesis of hypermodified Y base in phenylalanine tRNA, it was established that the synthesis of the Y base in a cell line from African green monkey kidney is regulated by the presence of methionine in the culture medium.

Dr. Ronald Hanson is studying the energy-linked pyridine nucleotide transhydrogenase found in the

cell membrane of *E. coli*. During the past year a mutation causing the loss of the enzyme activity has been mapped, and the effects of the mutation on the cells' physiology have been studied.

Dr. Vinayak Damle and Dr. Arthur Karlin synthesized a new affinity label for the acetylcholine receptor and identified its site of reaction as the acetylcholine binding site. Dr. Damle has identified agents which block the cation conducting channel of the acetylcholine receptor and which are to be modified to form covalently reacting labels for the channel. Dr. Susan Hamilton has shown that the chains isolated in solution in association with the acetylcholine binding chain are also closely associated in native membrane and are thus truly receptor subunits. Mr. Rashad-Rudolf Kaldany has reacted the receptor with covalently reacting fluorescent probes and shown that such probes undergo changes in fluorescent properties under receptor activation. Dr. David Wise has analyzed the shape of receptor in solution by neutron scattering techniques and the disposition of receptor in membrane by electron microscopy.

The laboratory of Dr. Alvin I. Krasna has been developing biological and synthetic systems for the splitting of water into hydrogen and oxygen by sunlight. Hydrogen is a non-polluting fuel and its use would decrease the concentration of carcinogens in the atmosphere. The structure and mechanism of the enzyme hydrogenase has also been studied.

The laboratory of reproductive biochemistry, headed by Dr. Seymour Lieberman, has demonstrated that more than one enzyme system exists in mitochondria from bovine adrenals for cleavage of the side chain of sterol precursors of steroid hormones. Preliminary results on the side-chain cleavage enzyme system from ovaries indicates that similar phenomena may exist in that tissue. The laboratory has also studied the lipoidal derivatives of steroids found in adrenals, testes, corpora lutea and placenta. The compounds isolated from placenta and corpora lutea contain palmitic (59 and 42%, respectively), stearic (31 and 19%) and oleic (10 and 39%) acids, but virtually no polyunsaturated fatty acids. Two steroids have been isolated from these non-polar fractions, pregnenolone which was the first lipoidal steroid isolated from adrenals and surprisingly, 3 β -hydroxyallopregnan-20-one. Several classes of lipoidal derivatives have been isolated from bovine adrenals. Three steroids have been found: pregnenolone, 17-hydroxypregnenolone, and dehydroisoandrosterone along with the fatty acids, palmitic, linoleic, linolenic and arachidonic acids.

Professor Barbara W. Low and her colleagues have continued their studies of postsynaptic

curaremimetic neurotoxins from the venoms of both land and sea snakes. With Dr. Martha R. Kimball she has investigated the details, particularly in the reactive site, of intramolecular packing in the prototype erabutoxin b as well as the significant features of the intermolecular interactions. Crystallization studies of neurotoxins not hitherto crystallizable are in progress. With Dr. Leslie L. Lessinger, Assistant Professor, Barnard College, Dr. Low has begun X-ray crystal structure studies of bile acids and their degradation products and of the compounds of the former, with known carcinogens. This is one aspect of the overall study of the etiology of colorectal carcinoma which was reported earlier. Dr. Kimball has recently obtained large crystals of phosphatidylethanolamine dipalmitoyl, a principal lipid component of biological membranes. This work forms a preliminary part of our efforts to achieve a better understanding of membrane structure and function.

Dr. M. M. Rapport in collaboration with Dr. S. Karpiak has continued studies on the alteration of CNS functions by antibodies and toxins that bind to components of synaptic membranes. They have shown that pure anti G_{M1}-ganglioside antibodies purified by affinity chromatography will induce seizure activity in rats when injected into the sensorimotor cortex. Choleragenoid (the B subunit of cholera toxin), which binds specifically with G_{M1} ganglioside sites but does not have the toxic properties of the complete toxin, also induces seizure activity. These two reagents provide a model for epilepsy based on interference with synaptic transmission involving a specific molecular component of synaptic membranes. Drs. Mahadik and Rapport are continuing their studies dissecting synaptic membranes into their antigenic components. By sequential extraction of highly purified synaptic membrane fractions with detergents, separation of the extracted polypeptides on gradient slab gels, and testing the individual bands by rocket immunoelectrophoresis against antiserum prepared against synaptic membrane fractions, it has now been possible to detect 7 different antigens. Four of these are also present in microsomal membranes but 3 are distinctive for synaptic membranes. Further purification is in progress. Dr. Rapport is continuing his collaboration with Dr. P. E. Duffy and Liselotte Graf of the Department of Pathology in applying immunohistological detection of glial fibrillary acidic protein to diagnosis of brain tumors.

Dr. Sol Spiegelman and his colleagues have continued their efforts to exploit the possible use of virus-like particles in human breast cancer as diagnostic signals for the presence of malignancy. They have detected a protein in human breast cancer which

is unique to this malignancy and crossreacts immunologically with gp52, a glycoprotein of molecular weight 52,000 and found in the mouse mammary tumor. They have developed a highly specific immunohistochemical stain for this protein which is now being used to identify malignant cells in tissue sections prepared from paraffin blocks. The procedure can detect both primary and metastatic lesions and is being used to correlate various clinical parameters with the presence of this unique antigenic signal.

Dr. David B. Sprinson and his colleagues (in collaboration with Dr. D. Schachter) continued a study in yeast of the contribution of sterols to membrane function; continued investigation of the mechanism of oxygenation reactions involved in removal of the methyl groups at C-4 and C-14 of lanosterol; studied the role of porphyrin in regulation of biosynthesis of catalase apoprotein in a series of heme requiring mutants of yeast. Participating in this work were Drs. Mella Adlersberg, Jean Dayan, Edith G. Gollub, Hideo Kochi, Utpalendu S. Maitra, Venkitachalam P. Mohan, Vepatu Shankar, Wolfgang Woloszczuk, and Mrs. K. P. Liu.

At the Department of Medical Genetics, University of Toronto, Dr. P. R. Srinivasan initiated research on the isolation and characterization of conditional lethal mutants in DNA synthesis in Chinese Hamster ovary cells. Two of the mutants which were defective in DNA synthesis at the non-permissive temperature of 38.5°, were also found to be more sensitive than the ancestral cell line at the permissive temperature of 34°, to alkylating agents such as ethylmethane-sulfonate and methylsulfonate, but insensitive to U.V. light. A spontaneous revertant which would grow at the non-permissive temperature showed the same degree of sensitivity to alkylating agents as the parental cell line at 34°. Thus the defect in DNA synthesis is also linked to the sensitivity to alkylating agents in these mutants. In addition to these studies he has also isolated mutants resistant to the following pyrimidine analogs: 3-deaza-uridine, 6-azauridine and 5-fluorouridine. The biochemical alterations and genetic studies of these mutants are being pursued.

Publications

Benesch, R.

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Oxygen Affinity and Polymerization of Native and

Honors and Activities

Drs. Reinhold and Ruth E. Benesch attended the INSERM Symposium on Development of Therapeutic Agents for Sickle Disease in Paris, France.

Dr. Max A. Eisenberg was on sabbatical leave for the Fall semester at the Hoffmann LaRoche Institute of Molecular Biology.

Dr. Arthur Karlin was appointed to the editorial board of *Molecular Pharmacology* and was Plenary Lecturer at the American Society of Biological Chemists meeting in Atlanta.

Dr. Alvin I. Krasna lectured at the Workshop Meeting on Hydrogen held in Göttingen, Federal Republic of Germany.

Professor Barbara W. Low presented papers at the Marseille Symposium on Structure and Conformation of Proteins and Peptides and at the Third International Symposium of Cytopharmacology in Venice, Italy.

University Professor Sol Spiegelman was the Hoffmann LaRoche Lecturer in Microbiology, Rutgers University, the Arnold Welch Lecturer, Yale University and the Fourth Tykociner Lecturer at the University of Illinois at Urbana.

Professor David B. Sprinson was appointed Professor Emeritus and Special Lecturer in Biochemistry.

Dr. P. R. Srinivasan was on sabbatical leave at the Department of Medical Genetics at the University of Toronto for the academic year. He chaired a Symposium on "Origins of Modern Biochemistry: A Retrospect on Proteins" held under the auspices of the New York Academy of Sciences.

Acknowledgment

The research activities of the department received support during the year from the following donors: American Cancer Society, the American Heart Association, the Kroc Foundation, the National Kidney Foundation, the National Science Foundation, and the National Institutes of Health. The department received gifts for support of graduate students from Merck Sharp and Dohme Research Labs. and Pfizer, Inc.

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Dermatology

LEONARD C. HARBER

Professor and Chairman of the Department • Director of Service

The past year was marked by a significant expansion in the patient care and research capabilities of the Department of Dermatology. The capacity of the newly renovated and air-conditioned in-patient service was increased. It is now composed of a sixteen bed unit with all rooms designed for one or two patients. This area also includes a teaching and conference room, as well as modern facilities for photo and hydrotherapy. The service also expanded its ambulatory care capabilities with the initiation of construction for an Ambulatory Psoriasis Treatment Center on the sixth floor of the Atchley Pavilion. Two new research laboratories were opened on the fifteenth floor of the Vanderbilt Clinic Building, bringing the total dermatologic renovated space in the medical school to 4,500 square feet.

The death of Doctor Carl T. Nelson, Emeritus Professor and former Chairman, saddened his many students, colleagues and all who had the privilege of being his associates. The Carl Truman Nelson Endowment Fund for teaching has been established in his honor.

Teaching

The Department continued its extensive teaching programs for medical students, residents and practitioners. The elective teaching program in the medical school was expanded to include medical students from six other schools and now encompasses the training of medical and pediatric residents. The Dermatology Continuing Medical Education Program, fully accredited by the Academy of Dermatology is

now accepting applications from physicians in the general medical community. This year the program was augmented by the inclusion of seminars taught by the Department of Pharmacology of the medical school and by the Mycology Section of Presbyterian Hospital. Departmental members also were part of the teaching faculties in seminars and continuing education courses in more than twenty medical schools throughout the country.

Research

During the past year, principal areas of research included mycologic, photobiologic and immunologic studies.

Dr. Richard L. Edelson, as Director of the Lowenfish Laboratory of Cutaneous Research, continued to supervise interrelated investigations in the immunobiology of the skin. The efficacy of antithymocyte globulin in the management of cutaneous T cell lymphoma was demonstrated, and the clinical features of this type of lymphoma were delineated. Cutaneous T cell lymphoma was shown to be a monoclonal disease.

Dr. Maureen Poh has continued her investigations into the mechanisms of diseases of porphyrin metabolism. A characteristic fluorescent porphyrin protein complex was discovered in the plasmas of patients with variegate porphyria which may be a diagnostic marker for that disease. In collaboration with investigators at the NIH and at the Scripps Research Foundation, she studied the effects of hematin on the metabolism of patients with erythropoietic protopor-

phyria as well as porphyrin-protein interactions in plasma of patients with several of the porphyrias.

Dr. Margarita Silva-Hutner, in collaboration with Dr. Norma Trevassos studied the morphology and mating reactions of 14 phenotypic variants of *Trichophyton rubrum*. She has also worked with Dr. Maureen Poh in a study of fluorescent metabolites of *Malassezia furfur*.

Dr. Carole L. Berger demonstrated that cutaneous T cell lymphoma is a malignancy of helper T cells and further characterized the effects of psoralen and ultraviolet A on lymphocyte subpopulations.

Dr. Robert Walther studied selected aspects of heme oxygenase enzymatic activity using radioimmunoassay technique in a co-operative project with investigators at the Rockefeller University.

Dr. Irene Kochevar pursued studies to elucidate the mechanisms of phototoxic reactions to the drugs chlorpromazine and protriptyline. Using a red blood cell hemolysis test system, she demonstrated that lysis of the cell membrane resulted from direct photoproducts of these compounds.

In collaboration with Dr. Leonard C. Harber, Dr. Kochevar also demonstrated the photoimmunologic potential of a cosmetic fragrance, musk ambrette.

Presently, Dr. Alan Andrews is continuing his studies of ultraviolet-induced DNA repair in humans by further characterizing the cellular and molecular effects of human DNA repair mutations. This work is designed to define the role played by DNA in the environmentally induced disease of the skin and other organs.

Dr. Gregory Zalar employed a mitogen stimulated leukocyte system to study the enzymatic defects of patients with acute intermittent porphyria and erythropoietic protoporphyria. He also evaluated derivatives of retinoic acid in treatment of psoriasis and disorders of keratinization.

Patient Care

During 1978 the Department expanded its participation in patient care. There were 13,668 visits to the Dermatology Clinic and 359 in-patient admissions. The consultation service evaluated 865 patients with a total of 1,425 consult-patient visits. The Dermatopathology Laboratory processed 4,246 biopsy specimens. Significant improvements in clinical service included our photosensitivity and psoriasis units.

The treatment of patients with photosensitivity diseases increased. One hundred patients with suspected photosensitivity disorders were evaluated. A photobiology conference, during its bimonthly meetings, reviewed diagnoses, progress and complications of patients with photosensitivity disorders.

The Ambulatory Psoriasis Treatment Center, now nearing completion, is designed to decrease the length of hospital stay for in-patients with psoriasis. Last year there were more than 3,500 patient days of hospitalization required for psoriasis. The Department enlarged its trained nursing staff to twelve nurses who are totally involved with dermatology patients. Sixteen in-patient beds were allocated to the Dermatology service, as our census was 120% of capacity last year.

Due to a larger demand, the Dermatology clinic hours were expanded by adding a Monday morning session. This clinic is especially devoted to the evaluation of pigmented lesions.

Honors and Activities

Dr. Leonard C. Harber was elected to membership in the Association of American Physicians and was selected as the 1978 Royal College Lecturer at the Canadian Dermatological Association's Annual Meeting in Winnipeg, was also guest lecturer of the Danish Dermatological Society and spoke on the porphyrias. Dr. Harber also was elected to the Presidency of the Faculty Center at the College of Physicians and Surgeons and the Executive Committee of the Medical Board of the Presbyterian Hospital.

Dr. Margarita Silva-Hutner is now President-Elect of the Medical Mycology Society of the Americas and was elected President of the New York City Branch of the American Society for Microbiology.

Dr. Richard L. Edelson was promoted to Associate Professor and was selected as the first Irma T. Hirschl Career Investigator in Dermatology. He was visiting professor at Yale University and gave lectures at the American College of Physicians in Boston, the Puerto Rican Dermatology Conference in San Juan, the American Academy of Dermatology in Dallas and the National Institutes of Health in Maryland.

In association with Dr. Edelson, Dr. Carole Berger has presented a paper on helper T cell activity in mycosis fungoides at the National Meeting of the Society for Investigative Dermatology. She co-directed a workshop in Dermatology at Columbia University, and is currently President of the Medical Mycology Society of New York.

Dr. Helen Curth was elected President of the Society for Medical Genetics and Dr. William Curth led a discussion group at the American Academy of Dermatology in Dallas.

Dr. Maureen Poh continued as Director of Porphyrin Laboratory Services for the American Academy of Dermatology. She also served as National Councilor for the Stephen Rothman Club for Dermatologic Research, and was made a member of

the Medical Advisory Board of the Erythropoietic Protoporphyrin Research and Educational Fund.

Dr. David N. Silvers was named Consultant in Dermatopathology to the Department of Dermatology, United States Public Health Service Hospital, Staten Island, New York. He was also Visiting Professor of Dermatology at Cleveland Clinic, Metropolitan Hospital, and Case Western Reserve University.

Dr. Eugene Sweeney was promoted to Captain, Medical Corp, USNR and is in charge of the Medical Unit of the NARDET in New York Naval Air Station.

Dr. Alexander W. Young, Jr. delivered lectures at the Albert Einstein School of Medicine.

Dr. Jack Eisert presented a paper on the cutaneous aspects of subacute bacterial endocarditis mimicking the skin findings of Tapeiner's angioendotheliomatosis at the Noah Worcester Society Meeting in Key Biscayne, Florida.

Dr. Steven Kohn discussed "Cutaneous Manifestations of Systemic Disease"

at the 14th Annual Meeting of the Eastern Society Teachers of Oral Pathology and at the American College of Physicians New Jersey Regional Meeting at Rutgers Medical School.

Dr. David Sibulkin was appointed Vice-Chairman of the Legislation Committee of the New York County Medical Society.

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Human Genetics and Development

Robert S. Krooth

Professor and Chairman of the Department

Research

During the past year the major research areas of the Department have been: 1) the physical, chemical and genetic structure of human chromosomes; 2) the molecular basis for cell determination and cell differentiation; 3) the genetics and pathogenesis of inherited disease; 4) cellular biochemistry, particularly as it applies to the stability, transmission, and expression of genetic information; 5) population genetics. I shall devote a paragraph to each of these topics.

Dr. Jagiello has continued her studies on the hormonal control of cytogenetic aspects of mammalian meiosis. She has begun to explore the internalization of luteinizing hormones in oocytes, and has developed pachytene maps of the ewe and mouse oocytes. Drs. O.J. Miller, D.A. Miller, R. Tantravahi and Dr. V.G. Dev have obtained evidence strongly indicating that a silver stain can be used to identify the chromosomal sites of transcriptionally active genes for ribosomal RNA. Drs. A. Henderson, K. Atwood, and D. Warburton, employing a somewhat different approach, have also collected data which provides persuasive support for this same conclusion. The conclusion is an important one because it permits investigators to use a relatively simple method for inquiring into the mechanisms that control the synthesis of ribosomal RNA. Drs. O.J. Miller, D.A. Miller, R. Tantravahi and V.G. Dev have recently shown that an increase of nearly six-fold in the number of ribosomal RNA genes on human chromosome can occur without clinical effect, in part because of the apparent inactivation of many of the extra gene copies. Dr. D.A. Miller and her associates have

continued their investigations on the comparative chromosome structure of man and related primates. Their observations suggest that man is more closely related to the gorilla than was hitherto supposed. Dr. O.J. Miller, in collaboration with Dr. B.F. Erlanger (Microbiology) and their respective colleagues, are extending their earlier studies on the use of specific immunochemical probes for the analysis of human chromosome structure. These investigations are proving useful both in the study of human evolution and in inferring the cytogenetic mechanisms which lead to human chromosomal abnormalities. Dr. K. Atwood and Dr. A.S. Henderson are continuing to employ *in situ* DNA/RNA hybridization in order to locate the genes for ribosomal RNA on the chromosomes of man and related species. They are also endeavoring to develop analogous methods for identifying the chromosomal sites of single-copy genes. In addition, Dr. Atwood and Dr. Komma are inquiring into the mechanism responsible for the magnification of the genes for ribosomal DNA in certain species. Dr. S. Phillips, in collaboration with Drs. E.A. Kabat and O.J. Miller, is examining the expression of the human ABH and I blood group antigens on the surfaces of proliferating hybrid cells (which are formed by fusing rodent and human somatic cells in culture). They are endeavoring to employ these cell hybrids to identify the human chromosomes that carry the genes for the sequentially acting glycosyl transferases that catalyze the synthesis of blood group substances. Dr. A. Bank, in collaboration with Dr. J.G. Mears and F. Ramirez, is continuing to analyze the structure of the genes which

encode the amino acid sequence of the protein subunits of human hemoglobin. They have employed molecular hybridization techniques, and have shown that the genes for the delta and beta subunits of hemoglobin are, approximately, 7,000 nucleotides apart on the chromosome. In addition they have found that each of these genes contains a 1,000 nucleotide sequence which interrupts the sequence that encodes the structure of the corresponding subunit.

Dr. Paul A. Marks has continued his studies on the regulation of the expression of genes for proteins that are characteristic of the erythrocyte. In these experiments, he employs cultured erythroid cells that have been induced to make such molecules. The goal is to identify the factors that affect both the onset and rate of synthesis of the characteristic proteins. In related investigations, Dr. R.A. Rifkind has analyzed the cell division cycle of cultured erythroid cells whose further maturation has been triggered by chemical agents. In collaboration with Dr. M. Terada, Dr. Rifkind has shown that a prolonged G_1 phase occurs in differentiating erythroblasts, and he has also demonstrated (with Dr. Roberto Gambari) that the synthesis of mRNA for globin begins during the G_1 phase of the cell's cycle. Dr. R.S. Krooth and his associates have developed a simple system for screening immense populations of mutagenized mammalian cells for the presence of extremely rare cells that contain mutant genes which affect cell determination. Theoretically such mutations should be recoverable from mammalian cell populations, but whether they will in fact be found is not yet known.

Drs. A. Bank, J.G. Mears and F. Ramirez have shown that certain types of thalassemia and related disorders are associated with the deletion of specific segments of human DNA, and that, in each case, the deleted segment includes a sequence that specifies part or all of the structure of a globin subunit. These studies represent the first proof that, as a result of recent or remote mutational events, specific gene sequences are sometimes deleted from the eukaryotic genome. Dr. R.S. Krooth and his colleagues have inquired into the pathogenesis of a rare disorder known as hyper-beta-alaninemia. This condition (originally described by others) is characterized clinically by unremitting somnolence and episodic seizures, and, biochemically, by elevated tissue and blood levels of beta-alanine and gamma-aminobutyric acid (GABA). They have found that at least one heterocyclic drug with hypnotic properties in man and animals is a non-competitive inhibitor of GABA-transaminase, and that beta-alanine causes hyperactivity and seizure-like behavior in infant rodents. In aggregate, these experiments suggest that the somnolence in the condition just mentioned is due

to the elevated brain levels of GABA and the seizures to elevated levels of beta-alanine. Dr. Krooth and his colleagues have also isolated, from a mutagenized population of mammalian cancer cells, a variant cell line which requires uridine for growth and which displays the same two enzyme deficiencies that have previously been observed in cell strains from patients with hereditary orotic aciduria. The variant line of cancer cells is proving useful both in further examining the pathogenesis of hereditary orotic aciduria and in clarifying the anabolism of several antineoplastic pyrimidine analogues. Dr. D. Warburton and Dr. Z. Stein (Public Health) are continuing their studies of spontaneous abortion in man. They have discovered a remarkably high incidence of chromosomal mosaicism among trisomic abortuses, and this finding has shed new light on the chromosomal mosaicism which is frequently seen in amniotic fluid cultures. (These latter cultures are employed clinically for the antenatal diagnosis of fetal chromosome abnormalities). Drs. Warburton and Stein have also found that neither previous saccharin intake nor previous *induced* abortions have a significant effect on the frequency of *spontaneous* abortion—observations which should enable obstetricians to reassure a considerable number of patients. Drs. L. Erlenmeyer-Kimling and J.D. Rainer are studying attentional processes and other aspects of information handling in children who, because of family history, have an increased risk of developing schizophrenia. In addition, Dr. Rainer, in collaboration with Drs. H.K. Fischman, L. Rozin (Psychiatry) and G. Jagiello are inquiring into the effects of heroin administration on the chromosomes of pregnant Rhesus monkeys and on the chromosomes of the offspring of such animals.

Dr. A.D. Bloom has continued his studies on the use of cultured lymphocytes to measure forward mutation rates at specific human loci. These investigations show promise of providing a simple system which can be incorporated into protocols for the screening of drugs and other compounds for possible mutagenic effects against the human genome. Dr. A. Weissbach is examining the initiation of DNA synthesis in human cells. He has identified the RNA and DNA polymerases involved in the formation of new DNA chains. Analogous investigations are being conducted on mammalian cells infected with tumor viruses. Dr. Sol Spiegelman and his colleagues have continued their efforts to exploit the possible use of virus-like particles in human breast cancer as diagnostic signals for the presence of malignancy. They have detected a protein in human breast cancer which is unique to this malignancy and which crossreacts immunologically with gp52, a glycoprotein of

molecular weight 52,000 and found in mouse mammary tumors. They have developed a highly specific immunohistochemical stain for this protein. The stain is now being used to identify malignant cells in tissue sections prepared from paraffin blocks. The procedure can detect both primary and metastatic lesions. Dr. Spiegelman and his colleagues have now begun to correlate various clinical parameters with the presence of this unique antigenic signal. Dr. H. Weissbach is primarily concerned with the development of a completely defined, cell-free system in which the expression of the galactose operon in *E. coli* can be studied. These investigations may eventually prove to be most helpful to those members of the Department who are concerned with gene expression in mammalian cells.

Dr. H. Levene has continued his theoretical studies on the evolution of organisms who live in highly subdivided populations. Populations of this sort are generally believed to have prevailed throughout most of the time during which the recent evolution of man occurred. Dr. R.S. Krooth has begun to employ population genetics as a means for obtaining new ways of classifying and analyzing human morbidity and mortality experience.

Patient Care

In the Progress Report for 1977, I described the units devoted to clinical genetics at the Medical Center and at the affiliated hospitals. Dr. A.D. Bloom

has responsibility for the over-all direction of the programs in Clinical Genetics. During the past year, 256 outpatients were seen in the Genetics Clinic at Babies Hospital, and approximately 125 in the satellite clinics at Harlem and St. Luke's Hospitals. The Genetics Clinic at Babies Hospital has recently begun a counselling service for families in which the sickle cell trait or disease is segregating. The Clinic has also added a psychiatrist to its staff—in order to enrich the professional resources available to patients and parents under emotional stress because of the presence (or suspected presence) of a serious genetic disorder. The genetics unit within the Department of Obstetrics and Gynecology has expanded its program for the antenatal diagnosis of inherited disease, and the clinical genetics unit in the Department of Psychiatry is continuing to see a growing population of people who are concerned about the genetics of psychiatric illness or of early-onset deafness. The Genetics Diagnostic Laboratory, under the direction of Dr. Dorothy Warburton, in the past year performed chromosome studies on approximately 350 peripheral blood specimens, 85 bone marrows, and 300 amniotic fluid samples.

The demand for genetic services, both in New York and throughout the country, is clearly continuing to grow. We all hope that the funds which become available to cover the cost of delivering such services will correspondingly increase and will eventually cover the *complete* cost.

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Medicine

THOMAS Q. MORRIS

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Acting Director of Service*

The Department of Medicine was shocked and saddened by the sudden and untimely death on November 26, 1978, of Dr. Daniel V. Kimberg. Chairman of the Department of Medicine, College of Physicians and Surgeons, Columbia University, and Director of the Medical Service, Presbyterian Hospital. Held in great esteem by his colleagues, Dan Kimberg in two very short years had compiled a record of outstanding accomplishment. He selflessly dedicated himself to meeting the challenges inherent in achieving high quality care for all patients, in maintaining excellence in the education of aspiring physicians, and in striving for eminence in clinical investigation. Every phase of his work was addressed with remarkable vigor and refreshing candor. In doing so, he not only charted the course for the Department to follow, but also established high standards for us to seek in both present and future endeavors. The tenure of his service, though abruptly shortened, will always be recognized as one of great distinction. The Department will sorely miss his wise and thoughtful counsel. On November 28, 1978, Dr. Thomas Q. Morris, Associate Chairman of the Department of Medicine, was appointed Acting Chairman.

Throughout 1978 the Department maintained its commitments to excellence in patient care, education, and research. Many of the highlights in each of these areas are contained in the divisions of this report. It is important, however, to emphasize at the outset that success in all of these areas was possible only because of the vigorous efforts of a talented and dedicated faculty.

Occupancy of beds on the medical services of all affiliated hospitals remained high, even in the face of decreasing length of hospital stay. Quality of patient care remained a major priority while renewed emphasis was placed on appropriate use of hospital facilities and cost containment. In addition, increased interest centered on high quality ambulatory care for both private and clinic patients. These emphases were not only consistent with long standing traditions within the Department but also in concert with the national goals of better delivery of health care at a reduced cost.

Review of undergraduate medical programs continued throughout the year. A major revision in the second year Introduction to the Patient course was planned for the coming year. Instead of the long standing weekly encounters comprising the body of this instructional effort, the course will be conducted in a solid four week block of time, designed to develop the awareness and skills essential for effective clinical learning and participation by the medical student newly entering a patient care setting. This course will involve all the major affiliated hospitals in the metropolitan area. At the same time the Major Clinical Year was reviewed by the Department with an aim toward refining and improving existing teaching techniques. Finally, serious consideration was directed at developing a required Ambulatory Care program during the fourth year of medical school.

Recruitment of new faculty continued throughout the past year. Efforts were made to attract investigators with particular skills in defining the etiologies and therapies for both common and

obscure disorders. Practitioners with both general and specialized skills were added to the staff, and we have also succeeded in attracting many highly skilled resident physicians and trainees who will serve as the source of tomorrow's practitioners, teachers, and investigators.

The Department of Medicine was fortunate to have a number of renowned visitors during the past year. Mr. Selwyn Taylor of the Royal Postgraduate Medical School delivered the first Sidney C. Werner lecture, the first of the series to honor Dr. Werner who served as a renowned clinician, teacher, and investigator in the Department for more than three decades. Dr. Samuel Thier, Chairman of the Department of Medicine at Yale University, served as the David Seegal A.O.A. Visiting Professor. Dr. Thier not only delivered a lecture to the faculty and students, but also participated in many clinical activities of the service.

Dr. Stanley E. Bradley, Samuel Bard Professor of Medicine and former Chairman of the Department of Medicine, retired on July 1, 1978 and assumed emeritus status. He immediately took up new responsibilities as Visiting Professor of Clinical Pharmacology in the Department of Clinical Pharmacology, University of Berne, Switzerland. He will continue the research activities which he has been pursuing for the past several years. He was honored by the Faculté of the University of Strasbourg by the awarding of the Degree of "Docteur Honoris Causa," a degree previously conferred upon Professors Michael Heidelberger, Andre Cournand, Robert F. Loeb, and Dana W. Atchley, all of the Department of Medicine at Columbia. The President of the University of Strasbourg expressed the hope that continuing this tradition would tighten the bonds of friendship and respect in linking Columbia University and the University of Strasbourg.

Dr. Henry Aranow, Jr. Samuel Lambert Professor of Medicine, also retired at the end of the academic year. Dr. Aranow, who twice served as Acting Chairman of the Department of Medicine, continued to be very much a part of educational activities at P&S. He lent his expertise to a new educational effort in medical ethics and also took on the medical directorship of an innovative radio program designed to acquaint the public with not only the clinical impact of recent advances in research but also the critical issues in health care administration and delivery today. The Department looks forward to the continuing participation of Dr. Aranow.

Dr. Hamilton Southworth, Professor of Clinical Medicine, also was appointed to emeritus status as he passed another milestone in his long and distinguished career in practice and teaching at the medical

center. Dr. Southworth, who continues in active practice, has been a source of strength and vitality for many members of the Department, all of whom eagerly anticipate his continued enthusiastic involvement.

Dean Tapley recognized the major contributions of Drs. Bradley, Aranow, and Southworth to the life of the Department of Medicine by presenting an award to each on behalf of the College of Physicians and Surgeons. To Drs. Bradley and Aranow he presented reproductions of original college seal designed in 1807, and to Dr. Southworth he presented a certificate of distinguished service. The Department echoes and applauds his sentiments.

Teaching

Education of medical students, residents, and postdoctoral fellows continued to be a primary objective of the department. In the first year medical school program Dr. Wylie C. Hembree III co-directed the Patient-Physician Relationship Course in which several members of the department served as preceptors. Correlation Clinics exercises in a number of basic science courses also were conducted by members of the staff.

In the second year of the medical school curriculum Dr. Robert E. Canfield served as course director of Abnormal Human Biology, a 250 hour course which extended throughout the entire year, and which emphasized basic pathophysiology. This course provides a logical transition between the basic science curriculum and the clinical clerkships. Instruction, which was organized according to systems was coordinated by the following faculty members: Dr. Ronald Drusin—Cardiology; Dr. Rejane M. Harvey—Pulmonary Diseases; Dr. Donald A. Holub—Endocrinology and Metabolism; Dr. I. Bernard Weinstein—Oncology; Dr. Robert Glickman—Gastroenterology; Dr. Qais Al-Awqati—Nephrology; Dr. Vincent P. Butler, Jr.—Immunology and Rheumatology; and Dr. Harold C. Neu—Infectious Diseases. Dr. Henry Aranow, Jr. directed and coordinated Introduction to the Patient for second year students. This course, which developed the basic skills of history taking and physical examination, was conducted at all of the metropolitan area affiliated hospitals where the following faculty served as Co-Directors: Dr. George C. Branche, Jr.—Harlem Hospital; Dr. Michael Bernstein—Overlook Hospital; Dr. Arthur R. Wertheim—Presbyterian Hospital; Dr. Henry M. Greenberg—Roosevelt Hospital; and Dr. A. L. Loomis Bell, Jr.—St. Luke's Hospital.

Dr. John N. Loeb was appointed Course Director for the Major Clinical Year Medical Clerkship, a

three-month block experience equally divided between Presbyterian Hospital and one of the other affiliated hospitals in New York City. Close communication and coordination among these institutions fostered the development of common educational goals and objectives. This was possible because of the efforts of the following Course Directors: Dr. Gerald E. Thomson at Harlem Hospital, Dr. Marianne J. Legato at Roosevelt Hospital, and Dr. John F. Bertles at St. Luke's Hospital.

The fourth year elective program involved the staff at every affiliated hospital, including the Mary Imogene Bassett Hospital in Cooperstown, New York. Subinternships in internal medicine were eagerly sought, as were experience in cardiology, infectious diseases, and other medical subspecialties. Increasing student interest in ambulatory care programs also was apparent. The elective program conducted by the Department of Medicine accounted for more than half of the course work elected by fourth year students.

Continuing medical education (CME) on a formal basis assumed greater importance. Many departmental conferences were certified for AMA Category I CME credit to help staff members meet the growing need for CME credit required for either licensing or certification by governmental or specialty society regulations. Prominent among these conferences was the Combined Staff Clinics, directed by Dr Elliott Osserman. This series, which was open to all physicians throughout the Columbia system, was also available to physicians in the local community.

Presbyterian Hospital: Clinical Activities

The remarkable increase in activity noted in the 1977 Annual Report of the Medical Service in Presbyterian Hospital led to the addition of twenty beds to the Service. This increment allowed a further increase in admissions to the Presbyterian Hospital Medical Service during 1978. The total of 4,719 was a new high. The additional number of beds prevented a great deal of unnecessary boarding of medical patients on other services and led to improved quality of patient care. In addition, the Medical Service was restructured into more reasonably sized units which did not present residents with overwhelming work loads. Admissions to the Harkness Pavilion Medical Service numbered 3,108, which was 55 less than 1977. The total of 7,827 admissions to the combined medical services was a new high, however, which helped to maintain occupancy in the face of ever decreasing lengths of hospital stay.

In concert with renewed emphasis on outpatient medical care and teaching, more than fifty members of the faculty were assigned to new responsibilities in

either the Walk-In Clinic in Area B or in the Group Clinics. This massive commitment by the Department was aimed at improving the quality of patient care and the level of housestaff and student teaching in these areas. A particular feature of this effort was the assignment of Physicians In Charge to the Group Clinics. These staff members served not only to oversee the clinical activities of the housestaff but also to facilitate patient care activities in the Clinic. Faculty who served in this role were Drs. Qais Al-Awqati, Oliver Fein, Donald A. Holub, James Reiffel, Jane S. Sillman, Jeffrey Stein, Joseph Sweeting, Arthur R. Wertheim, and Robert T. Whitlock. Another major effort in this Ambulatory Care program was the formation of a group practice, Associates in Internal Medicine, whose goal is to provide ongoing care for clinic patients in a model system involving individual patient-physician relationships and financial accountability.

Visits to the emergency (Area A) and walk in (Area B) of Vanderbilt Clinic continued to spiral. Dr. Kenneth Fine directed patient care in Area A where 37,321 patient visits were recorded. In Area B another 30,124 patients were seen. In the latter location patients were managed by a team of attendings, residents and nurse practitioners. Utilization of Group Clinic (26,508) and the Medical Specialty Clinics (23,833 visits) again remained very high. Dr. Oliver Fein was in charge of activities in the Group Clinic. Activities in all medical clinics were coordinated by Dr. Michael M. Stewart, Director of Medical Clinics.

Patient Statistics

Admissions—7,827; Deaths—670; Autopsies—133.

The majority of patients admitted to the Medical Service continued to have multiple diagnoses. The most frequent presenting problems were those of cardiovascular disorders, although diabetes mellitus was among the most common diagnoses made at Presbyterian Hospital.

During 1978 the housestaff was expertly directed by Chief Resident, Dr. George Eliopoulos. The total of 68 residents was distributed as follows: R-I 25; R-II 22; R-III 20; and R-IV 1.

The increment in housestaff allowed the Medical Service to cover the additional twenty beds in an optimum fashion. The added residents also permitted the internal reorganization of the Service, a step necessary to facilitate patient care. In addition more residents were also assigned to the Walk In Clinic. Staffing was also maintained in the Medical Intensive Care Unit where Dr. Glenda J. Garvey coordinated teaching and patient care. Increased resident cover-

age was also available for the Coronary Intensive Care Unit where Dr. James Reiffel directed similar efforts.

Teaching in the private patient setting continued to be a high priority for the Medical Service during 1978. The 7th and 9th floor service in Harkness Pavilion, successfully launched in July of 1977 under the direction of Dr. Robert T. Whitlock, continued to prosper. This service was structured along traditional guidelines with a visiting attending physician, a supervisory resident, three interns, and medical students. Guidelines for operation of the service were designed to provide opportunities for exercise of initiative and responsibility by the housestaff, while preserving the needs of the patients and their private physicians. The successful development of this program in Harkness Pavilion has accomplished a significant broadening of the undergraduate and graduate teaching programs at Presbyterian Hospital. The design and organization of this unit will serve as a model for other private patient settings. Efforts are currently in progress to extend some elements of this program to the many scattered locations for medical patients throughout Harkness Pavilion. To date Dr. Arthur R. Wertheim has been able to use these facilities to develop an attractive and sought after rotation for fourth year medical students seeking sub-internship experience.

The quality of patient care on the Service was monitored by a number of committees. Dr. Kimberg chaired the Clinical Competence Committee which evaluated the bedside skills of the resident staff. This critical evaluation, which was performed by many faculty throughout the Department, is required of every medical service as an integral part of certifying residents as qualified to take the written examination of the American Board of Internal Medicine. Dr. Wertheim played a particularly important role in evaluating the skills of all third year residents. After many years of excellent service Dr. George A. Carden stepped down as Chairman of the Medical Audit Committee. He was replaced by Dr. Jack Weissman. The Medical Service Peer Review Committee was chaired by Dr. Michael J. Cohen who was assisted by Dr. Gail S. Williams and Dr. Morris. The Utilization Review Committee of the Medical Service was expertly directed by Dr. Robert H. Heissenbuttel who was ably assisted by Dr. Martin W. Oster and Dr. Jeffrey A. Stein. This time-consuming task, mandated by regulatory agencies, plays a particularly important role in determining appropriate lengths of stay for hospitalized patients. The Medical Service Patient Care Committee was chaired by Dr. Kermit Pines in coordination with Ms. Sandra Byrd, Associate Director of Nursing for Medicine. Drs. Kim-

berg, Morris, and Eliopoulos, as well as the head nurse from each service unit worked together on this committee in order to improve the quality of patient care in our hospital.

Cardiovascular Diseases Division

Teaching

The division continued daily Consultation and Cardiac Intensive Care Unit rounds and conducted six weekly conferences and seminars. The clinical and research electives of the division were well subscribed. The enlarged consultation teaching service for medical students and Presbyterian Hospital house officers was a new and very active teaching endeavor.

Clinical Activities

Drs. Alan Nichols and Allan Schwartz joined the division in 1978. Dr. Nichols worked in the Diagnostic Cardiovascular Laboratory and Dr. Schwartz played a major role in the non-invasive and cardiology postdoctoral training program.

The section of Nuclear Cardiology under Dr. Paul J. Cannon rapidly expanded its clinical activities. This group performed research and clinical non-invasive studies using scintillation cameras and $^{210}\text{thallium}$ to assess myocardial perfusion at rest and during exercise in patients suspected of coronary artery disease and $^{99\text{m}}\text{Tc}$ pertechnetate to measure left ventricular ejection fraction and wall motion by radionuclide angiography.

The Arrhythmia Control Center under Dr. J. Thomas Bigger, Jr. continued its clinical activities. A section on Clinical Electrophysiology was established in 1978 with Dr. James A. Reiffel as Director. Excellence in clinical investigation of human cardiac electrophysiology had been a tradition in the division since 1967. Clinical services, however, had not been available. The mission of this new section is to provide diagnostic and consultative services for cardiac arrhythmias and conduction disturbances via cardiac electrophysiologic studies. A new catheterization laboratory will be made available to Clinical Electrophysiology and new personnel are being recruited to expand this activity. The heart attack follow-up data base began to provide clinical services in 1978. The data base began as a research endeavor but as results have accrued it has become a useful clinical tool. The information services of the Cardiology Computer Center now benefit patient care by providing clinicians with accurate and up-to-date information on our previous experience with heart attack patients. Ambulatory monitoring services continued to expand and to improve. Computer processing of

24-hour recordings became available for postinfarction patients because it was clear that precise quantitative information was helpful in managing these patients. Dr. Richard J. Stock continued his effort to develop a computerized ECG telemetry surveillance system. Dr. Francis M. Weld and Ms. Sara Wells (Nursing) began a postinfarction cardiac rehabilitation program to improve and individualize the care of patients who have suffered acute myocardial infarction.

Drs. A. Nichols, P. Walter, D. Blood, M. Weiss and P. Cannon continued studies of the determinants of regional myocardial blood flow in patients studied at the time of cardiac catheterization. These studies attempt to determine the physiological significance of coronary artery lesions observed at arteriography. In addition, attempts were made to assess the effects of reduced coronary blood flow upon ventricular performance in man and to determine the role of adenosine in control of coronary flow in patients with angina pectoris.

Drs. D. Blood, D. McCarthy, L. Johnson, R. Sciacca and P. Cannon used myocardial perfusion imaging with ^{201}Tl and "first pass" radionuclide angiocardiology to document the influence of regional ischemia and previous myocardial infarction upon left and right ventricular performance during exercise. Drs. McCarthy and Blood studied the value of myocardial perfusion imaging with ^{201}Tl as a screening test for coronary artery disease in patients with uninterpretable exercise ECG stress tests and in patients unable to perform adequate exercise during the test. Together with R. Sciacca they used computer techniques to improve the accuracy of ^{201}Tl myocardial perfusion scan interpretation. Drs. Weiss, Johnson and Goldman studied the effect of after load reduction with prazosin upon left ventricular function in patients with advanced cardiac failure.

Dr. Juan Oliver and Dr. Paul Cannon completed a study which documented the important effects of acute and chronic alterations of sodium balance upon the renal vascular reactivity to angiotensin II and to norepinephrine. Additional studies suggested that renal vascular response to angiotensin II is blunted when the vascular receptors for A_{II} in the kidneys are occupied by endogenously formed polypeptide and the response to A_{II} is enhanced when endogenous A_{II} availability is reduced. Together with Drs. Vinci and Kaiser of the N.I.H. they also found that urinary kallikrein excretion was reduced in patients with diffuse scleroderma with renal involvement at a stage antedating the malignant hypertension and oliguric renal failure which occurs in some patients with this illness.

Dr. Margaret M. Kilcoyne continued the devel-

opmental phase of her study of human hypertension. Plasma renin activity in relation to urinary sodium excretion is lower than expected for age during the developing phase of hypertension. This finding contrasts with that observed in adolescents and young adults who already have sustained hypertension when initially evaluated. In these patients the same spectrum of plasma renin activity found in adults, high, low and normal, is observed. Hemodynamic studies in collaboration with Dr. Carl Steeg (Department of Pediatrics) showed uniformly elevated cardiac output in a limited number of studies. These workers are now studying the responses of diastolic blood pressure recorded on an ambulatory recorder during standardized exercise. Dr. Kilcoyne continued her serial studies of vasoactive substances in patients prior to and following correction of coarctation of the aorta in collaboration with Dr. Sylvia Griffiths (Department of Pediatrics) and Dr. James Malm (Department of Surgery). She also is investigating the renin-angiotensin system in the central nervous system in collaboration with Dr. Earl A. Zimmerman (Department of Neurology). The interaction of these vasoactive substances and possible quantitative changes in the brain compared to the periphery in normal and rats with hereditary diabetes insipidus is under study.

Drs. Francis M. Weld and J. Thomas Bigger, Jr. continued their postmyocardial infarction follow-up program. The major objectives of the study are to assess the risk of recurrent heart attack and sudden death and to determine how and why those events occur. It is expected that this knowledge will be valuable for designing intervention trials in the future. During 1978, patients who suffered an acute myocardial infarction had two special studies before going home: a 24-hour Holter ECG and a standardized exercise test. These tests detect arrhythmia, ischemia and left ventricular dysfunction. In 1979, the Columbia study will be broadened to a national one involving eight hospitals at the four following universities: Washington University, University of Rochester, Columbia University and the University of Arizona. Radionuclide angiography will be added to the special pre-discharge tests in order to more precisely measure left ventricular performance. At Presbyterian Hospital, Drs. Johnson and Cannon will be responsible for radio-nuclide studies.

Mr. Kenneth P. Birman, Ms. Linda M. Rolnitzky and Dr. Bigger developed a new automatic QRS shape classification algorithm which permits recognition and classification of ventricular premature depolarizations. This software was extensively tested and then installed as a production item. The computer system Columbia IV is used for high speed process-

ing of 24-hour tape recordings from many studies in an attempt to learn more about the mechanism, significance or therapeutic control of ventricular arrhythmias.

Dr. Elsa-Grace V. Giardina, in collaboration with Dr. Bigger, continued studies evaluating the efficacy and pharmacokinetics of a sustained-release preparation of procainamide in cardiac patients with frequent ventricular premature depolarizations (VPD's). Dr. Giardina and Dr. Bigger in collaboration with Drs. Alexander H. Glassman, (Psychiatry) James M. Perel (Psychiatry) and Shepard H. Kantor (Psychiatry) showed that the tricyclic antidepressant imipramine is antiarrhythmic in depressed patients with VPD's. They are now evaluating imipramine's efficacy, kinetics and short or long term adverse effects in cardiac patients with VPD's.

Drs. Edward B. Leahey, Jr., Giardina, Bigger, and Perel are evaluating the long-term effectiveness and toxicity of a new "oral lidocaine," mexiletine. The studies evaluate efficacy against ventricular arrhythmias as well as metabolism of this compound.

Drs. Leahey, Reiffel, Bigger, Vincent P. Butler, Jr., and Giardina continued their study of an important drug interaction discovered at the Columbia Presbyterian Medical Center—the increase in digoxin concentration which often occurs when quinidine is administered to patients taking digoxin. The mechanism of this phenomenon is being sought in animal models and *in vitro* systems. The incidence and time course of the interaction is being investigated in prospective studies in the General Clinical Research Center. A study is being conducted to determine if other cardiac antiarrhythmic drugs also cause the phenomenon.

Dr. James Reiffel continued his studies of the human sinus node in collaboration with Drs. Bigger, Giardina and Jesse Davis. Atropine dose response studies are being conducted to evaluate differences in cholinergic receptor function between normal subjects and persons with sinus node dysfunction. Clinical electrophysiological studies are being used to determine the effects of digoxin and procainamide on the sinus node of patients who have sinus node dysfunction.

Because of the dearth of information, Drs. Leahey and Bigger began a study to characterize cardiac rhythm in normal young persons. The P&S Class of 1980 was enrolled in the study. The cardiovascular status of the subjects was carefully characterized by questionnaire, physical examination and selected laboratory tests, e.g., lipid profile, chest x-ray, 12-lead electrocardiogram and echocardiogram. A 24-hour recording of the ECG was made and analyzed by computer. This study is designed to improve our

knowledge about normal cardiac rhythm and its variance in the young adult. It is hoped that 10 and 20 year follow-up studies of the participants can be obtained to provide information on the natural history of cardiac function.

Drs. Weld and Bigger continued their study of the effects of tricyclic antidepressants on mammalian heart cells. With Dr. Perel they undertook a micro-electrode study of imipramine and its metabolites. Drs. Perel, Giardina and Bigger found significant concentrations of three metabolites (desmethylinipramine, 2-hydroxyimipramine and 2-hydroxydesmethylinipramine) in the plasma of outpatients being treated with imipramine. The intensity of action of each of these metabolites on cardiac membrane electrogenesis is being compared to imipramine itself to determine the potential clinical significance of these compounds.

Drs. Carl A. Rasmussen, Bigger, and Weld continued their studies on the interaction between calcium ion and the membrane surface charge in cardiac Purkinje fibers.

Honors

Dr. M. Irene Ferrer gave the Louis Mark Memorial Lecture at the National Scientific Assembly of the American College of Chest Physicians. She also served on the editorial board of the *American Heart Journal*, as editor-in-chief of *JAMWA* and *Cardiology Concepts* and as Chairman of the Criteria Committee of the New York Heart Association.

Dr. Paul Cannon gave invited lectures in the symposium, Nuclear Cardiology—1978, at the Annual Scientific Session of the American College of Cardiology and at a symposium on Non-Invasive Radionuclide Methods held in Regensburg, Germany. He served on the editorial board of *Circulation* and on the Cardiovascular Study Section of the National Institutes of Health.

Dr. Elsa-Grace V. Giardina delivered an address at the Annual Assembly of the Pharmaceutical Manufacturers Association.

Dr. J. Thomas Bigger, Jr., gave invited lectures at the International Congress of Anesthesiology in Paris and at the annual Computers in Cardiology Meeting, Stanford, California. He chaired a symposium on "Ventricular Arrhythmias in Chronic Ischemic Heart Disease" at the annual Scientific Session of the American Heart Association. He delivered a lecture on "Currently Available Antiarrhythmic Drugs—A Critical Appraisal." He also served on the editorial boards of *Stroke*, *JPET*, *Pharmacology and Cardiovascular Pharmacology* and the *American Journal of Medicine*.

Dr. Margaret Kilcoyne gave lectures on juvenile

hypertension at The International Symposium on Hypertension in Paris, to the New England Cardiovascular Society and at the Bowman-Gray School of Medicine.

Endocrine Division

Teaching

The Division of Endocrinology participated extensively in teaching activities in the Department of Medicine. Undergraduate activities included: 1) The Endocrine Section of Abnormal Human Biology, involving both lectures and preceptor sessions for a 2-week period; and 2) An intensive 1-month elective course in Endocrinology and Metabolism in the fourth year (ENO1P, Dr. Frantz), given once a year. This course, in which essentially all members of the Division participated, involved daily lectures and seminars in all phases of endocrinology and metabolism. The course is highly structured, with outlines supplied for each day's activities. These consist of didactic classroom sessions in the morning and clinical activities in the afternoon. It is limited to 20 students and has been oversubscribed every year since it was first offered. Other teaching activities included: 3) A 1-month fourth year clinical elective (ENO3, Dr. Holub), offered in 9 of the 12 months, limited to one student, involving patient consultations and regular work rounds with the endocrine resident, fellow, and two co-attending; and 4) a three month clinical elective (ENO9P), involving laboratory or occasionally clinical investigations in any of the laboratories of the members of the Division of Endocrinology, generally limited to one or two fourth year students per laboratory.

Graduate teaching involved both housestaff training and fellowships in Endocrinology and Metabolism. The latter are usually two or three year periods of training for which Ph.Ds as well as physicians are eligible. The characteristics of the training are varied to suit the needs and background of individual fellows. Typically, postgraduate physicians have devoted approximately three quarters of time spent in research in the laboratories of one or more members of the Division, and one quarter of time spent in clinical activities; occasionally, the majority or all of the time has been spent in clinical training. The latter, in which housestaff are also involved on a rotation basis, consists of regular endocrine consultations throughout the hospital, work rounds with two co-attending, and attendance at Combined Endocrine and/or Thyroid Clinics.

In addition, and open to all who wished to attend, were 1) Weekly Endocrine Conferences; 2) weekly endocrine walk rounds; and 3) weekly Endocrine

Seminars, in which topics of current research interest in Endocrinology are presented by both guest speakers and members of the Columbia University faculty.

Research Activities

Dr. Andrew G. Frantz continued his studies of control mechanisms of pituitary hormone secretion. With Dr. Sharon Wardlaw he devised a radioimmunoassay for the recently identified peptide β -endorphin, which is a constituent of the larger β -lipotropin molecule found in human and animal pituitary glands. By means of the radioimmunoassay β -endorphin, as well as β -lipotropin, were found in appreciable quantities in the circulating blood of normal individuals. Studies of the physiology of these two peptides are currently in progress. With Dr. David Kleinberg (New York University) and Dr. Marcus Schaaf (Walter Reed Army Institute of Research), Dr. Frantz studied two experimental ergot-derived drugs, lergotriple mesylate and bromergocryptine, which are effective long-term suppressors of prolactin secretion. Both of these drugs were found to be highly effective in the treatment of pathologic hyperprolactinemia, whether due to pituitary tumors or other causes, and were successful in stopping galactorrhea, restoring normal menses, and inducing fertility in women whose hyperprolactinemia was accompanied by galactorrhea and amenorrhea. Both drugs were also found to lower serum growth hormone in patients with acromegaly. A study of their effects in patients with this disease has recently been published. With Drs. Richard A. Polin, Kazim Hussein, and L. Stanley James of the Department of Pediatrics, Dr. Frantz measured vasopressin concentrations in the umbilical cord blood of human babies at birth. The extremely high levels of vasopressin found do not correlate with the apparent stress. Further studies of the mechanisms involved are in progress. With Dr. Michel Ferin (Department of Obstetrics and Gynecology), Dr. John Antunes (Neurosurgery) and Dr. Earl Zimmerman (Neurology), Dr. Frantz explored mechanisms governing pituitary hormone release in monkeys in which an "island" comprising the hypothalamus and pituitary, disconnected from the rest of the brain, was created by means of a special Halasz knife. Normality of some endocrine functions, including cyclic ovulation, was preserved, whereas the response of many hormones to stimulation and suppression was impaired.

Dr. John N. Loeb continued his studies on the role of rat liver cytoplasmic glucocorticoid hormone receptors in the mediation of physiological responses to a variety of different stimuli. In collaboration with

Dr. William Rosner at The Roosevelt Hospital he demonstrated that both surgical stress and partial hepatectomy induce a striking depletion of cytoplasmic receptors but that the mechanisms responsible are different. In contrast to the fall induced by surgical stress, which is mediated by increased endogenous secretion of glucocorticoid, that induced by partial hepatectomy does not require the presence of the adrenal glands. In other studies in collaboration with Dr. Rosner, Drs. Gholamhosein R. Omrani and Loeb have shown that exposure of normal rats to a brief period of defined physiological stress (two minutes of swimming) results in an extremely rapid, adrenal gland-dependent, depletion of cytoplasmic receptor followed by induction of the hepatic enzyme tyrosine aminotransferase. This observation constitutes the first demonstration of an effect of a physiological change in glucocorticoid hormone secretion on cytosol receptor levels and a coupled physiological response. In other studies Drs. Omrani and Loeb have been examining the effects of progesterone (a steroid with anti-glucocorticoid properties *in vitro*). In striking contrast to its anti-glucocorticoid effects *in vitro* they have found that progesterone is a potent inducer of tyrosine aminotransferase in the normal rat, and that this steroid markedly potentiates the effect of simultaneously administered small doses of glucocorticoid hormone in the adrenalectomized animal. Additional observations suggested that this "glucocorticoid-mimetic" action of progesterone *in vivo* may be attributable to competition of progesterone for glucocorticoid binding sites on transcortin with a resulting increase in the circulating level of free glucocorticoid hormone. Studies in collaboration with Dr. John P. Bilezikian on the relation between thyroid status and catecholamine sensitivity showed that sustained states of hyperthyroidism and hypothyroidism can be conveniently established in the turkey, and that erythrocytes from such animals exhibit characteristic changes in catecholamine sensitivity without intrinsic changes in binding affinity. Reduced sensitivity to catecholamines in the hypothyroid state appears to be mediated by a fall in beta-adrenergic receptor number. In contrast, heightened sensitivity to catecholamines in the hyperthyroid state is unaccompanied by a change in receptor number but rather reflects amplification of the hormonal signal "distally" such that occupation of a given number of receptors at physiological concentrations of catecholamines leads to increased levels of cyclic AMP.

Dr. Richard S. Rivlin, with Drs. John Pinto and Yee P. Huang have shown that phenothiazine derivatives and tricyclic antidepressants markedly antagonize the conversion of riboflavin into its active

coenzyme derivative, flavin adenine dinucleotide, in various organs of the rat. The mechanism of this effect appears to be inhibition of flavokinase, the first of two enzymes in the biosynthesis of flavin adenine dinucleotide from riboflavin. In addition, these investigations have shown that the thyroxine stimulation of flavin adenine dinucleotide biosynthesis in liver and brain is age-dependent. With Dr. Robert McConnell, Drs. Rivlin, Pinto, and Huang recently completed a study showing that boric acid intoxication in man results in massive loss of riboflavin in the urine. This study was performed by investigating patients who reported accidental ingestion of boric acid to the New York City Poison Control Center over a three year period. Drs. Rivlin and Pinto have also shown that thyroid hormones in low doses enhance the formation of flavins bound covalently to tissue proteins. This effect of thyroid hormones was demonstrable in cerebrum and liver from adult animals. Dr. Rivlin and Mr. Bruce Silverman (Graduate Student, Institute of Human Nutrition) investigated the effects of alcohol upon the intestinal binding and absorption of zinc. Drs. McConnell, Martha Osnos and Rivlin have continued to investigate the abnormalities of taste and smell demonstrable in patients with hypothyroidism, and have studied the relationship of these abnormalities to disturbances in zinc metabolism both in patients and in an appropriate animal model. These investigators working in collaboration with Drs. Irwin D. Mandel and Robert Stuchell (Division of Preventive Dentistry, School of Dental Medicine) have been determining the effects of altered thyroid function upon salivary flow and composition.

Dr. Kenneth Sterling's research program has continued with the collaboration of Dr. Toshiro Sakurada, Visiting Assistant Professor of Medicine from Japan, who carried out valuable initiatives in collaboration with Dr. Sterling. Since Dr. Sakurada's return to his academic post in Japan, Bhanumas Dhargromgartama has continued the laboratory studies. The findings have provided strong confirmation of direct thyroid hormone action upon the mitochondria *in vivo*. This pathway entails rapid activation of mitochondrial oxidative phosphorylation and precedes the more widely known effect upon the cell nucleus which results in augmented synthesis of inducible proteins. The mitochondrial effects are not blocked by the administration of the protein synthesis inhibitor, cycloheximide, in a dose sufficient to abolish new protein formation in the experimental rat. Dr. Sterling found affinity chromatography employing T_3 -Sephadex to be useful in isolation of mitochondrial membrane triiodothyronine binding protein, in contrast to the nuclear thyroid hormone

binding protein fractionation work in which affinity columns have thus far been of no avail. The physical-chemical characteristics of the two binders, including chemical composition, molecular weights, and electrophoretic mobilities proved to be different. After partial purification, the mitochondrial receptor was shown to be a lipoprotein macromolecule with strong and specific binding of T_3 ($K_A \sim 10^{11} M^{-1}$). Material of about 85% purity has been obtained. Further data from rat studies suggest direct stimulation of mitochondrial ATP synthesis by thyroid hormone after binding by a receptor of the inner mitochondrial membrane.

Division of Endocrinology

Honors

Dr. Kenneth Sterling served as Chairman of the Committee to visit the Medical Department of Brookhaven National Laboratory for 1977/78. Dr. Frantz continued to serve as an Associate Editor of *Metabolism*. He was an invited speaker at the Post-graduate Assembly of the Endocrine Society, the Annual Meeting of the American College of Surgeons, and at numerous seminars and conferences in New York, Boston, Washington, Cleveland, Cincinnati, Dallas, and Kansas City. He has also served as a site visitor for the NIH.

Dr. Rivlin served as Chairman of the Water Soluble Vitamins Sessions at the Annual Meeting of ASEP (April, 1978). Dr. Rivlin also serves on the Education Committee of the American Thyroid Association, the Membership Committee and Research Committee of the American Society for Clinical Nutrition, and as Consultant for the Food and Drug Administration, the Standing Committee on Health of the New York State Assembly, and the Conference Committee of the New York Academy of Sciences.

Gastroenterology Division

Teaching

Drs. Robert M. Glickman (Director), Thomas A. Grasitus, Peter Green, Hugh Nellans and Alan Tall joined the full time faculty of the Gastroenterology Division during the past year, and Dr. Oscar Lebwohl became a member of the clinical faculty of the Division. The fellowship program was expanded from two to three years with positions for two new fellows each year. The portion of the fellowship program devoted to research training is supported by newly awarded Gastroenterology Research Training Grant from the National Institutes of Health. Teaching and clinical conferences have been ex-

panded with weekly journal club, research conference and liver biopsy conference. In addition, inter-hospital gastroenterology rounds are now being held monthly on a rotating basis among the Columbia-affiliated hospitals.

Clinical Activities

A newly created Gastrointestinal Endoscopy Suite, located on Presbyterian Hospital third floor, was opened during the past year. The new Unit, dedicated to Dr. Charles A. Flood, provides an expanded capability to conduct a variety of gastrointestinal endoscopic procedures.

Research Activities

Drs. Glickman, Green and John Riley have been investigating the role of the intestine in lipoprotein synthesis. They demonstrated the active synthesis by the intestinal epithelium of several important apoprotein constituents of intestinal lipoproteins. Studies in experimental animals have shown that the intestine actively synthesizes three major apoprotein components—apoB, A-I, A-IV during lipid absorption. These studies have been extended to human intestinal mucosa, obtained by peroral biopsy, in which the active synthesis of these apoproteins also was demonstrated. Recent studies in two patients with chyluria showed that the human intestine is a quantitatively important source of these apoproteins and synthesizes approximately 50% of the body's requirement for apoA-I and A-II. Since these two apoproteins are the major components of circulating high density apoproteins, the intestine appears to have an important role in HDL metabolism. In additional studies it was shown that defective intestinal synthesis of apoprotein B occurs in the rare genetic disorder, abetalipoproteinemia where there is a total inability to form chylomicrons. These studies underscore the importance of specific apoprotein synthesis in fat absorption.

Drs. Green and Glickman also studied the role of the intestine in high density lipoprotein metabolism. Their studies in the rat have shown that the intestine is a major synthetic site for apoprotein A-I, the major protein of serum high density lipoproteins. In addition, intestinal lymph HDL has been characterized and found to be secreted as discoidal particles enriched in phospholipid and poor in cholesterol. These studies suggest that the intestinal mucosa is an important synthetic site for HDL synthesis. In view of the proposed protective role for HDL in the development of atherosclerosis, factors modifying the amount and composition of intestinal HDL will be of great interest.

Dr. Tall initiated studies on the peripheral metabolism of chylomicrons. It has been shown that subsequent to lipolysis of chylomicrons, there is a transfer of chylomicron phospholipid and protein to the HDL fraction of plasma. Thus chylomicrons represent an additional source of circulating HDL components and may be of importance in the regulation of plasma HDL levels. In additional studies Dr. Tall is exploring the structure of HDL.

Dr. Brasitus, working with Dr. David Schachter (Physiology), conducted studies on the lipid and protein composition of the small intestinal microvillus membrane. Using the technique of fluorescence polarization, information was gathered on the interrelationships between the lipid and protein constituents of this intestinal membrane. Additional studies are planned to evaluate possible membrane abnormalities in inflammatory bowel disease.

Dr. Joseph Sweeting continued studies on the natural history of inflammatory bowel disease and the influence of medical and emotional factors thereon.

Dr. William M. Lee began exploring the pathophysiology and clinical usefulness of ascites reinfusion using the Rhodiascit apparatus designed in France.

Drs. Hugh Nellans and Daniel V. Kimberg investigated the modes of calcium transport in the rat small intestine at both the tissue and isolated membrane level. Recent investigations have shown that the *in vitro* rat ileum demonstrates net secretory solute flux through extracellular pathways in the absence of net driving forces between the bathing media. Drs. Kimberg and Nellans have demonstrated that net secretory calcium flux is mediated by this mechanism and may serve a physiological role in total calcium homeostasis. In addition, Drs. Nellans and Kimberg have investigated the uptake mechanism of calcium in isolated microvillus membrane vesicles from small intestine. These vesicles demonstrate specific selectivity for D-glucose transport and have been shown to exhibit carrier-mediated kinetics for calcium influx. In addition, sodium appears to compete for calcium entry into the vesicles, suggesting, in conjunction with previous work in whole tissue, the existence of a luminal membrane mechanism capable of sodium and calcium countertransport driven in part by the sodium gradient. Furthermore, calcium transport across basolateral cell membranes has been undertaken to explore the ATP-dependent component of cellular calcium extrusion. It is hoped that this cellular and subcellular analysis of calcium transport mechanisms will ultimately lead to a better understanding of the defects in calcium homeostasis in disease states such as rickets, osteomalacia, and chronic renal failure.

Dr. Bradley continued exploring the role of charge barriers in determining ionic movement into bile and hepatic lymph. During the past year he found that an increase in permeability to macromolecules develops in the canaliculi of hypothyroid rats in association with diminished capacity to excrete bile acid and organic anions. With Dr. Thomas Q. Morris and Mrs. Katherine J. Baker, work continued on the patterns and mechanisms of plasma protein loss in the bile.

Honors

Dr. Robert Glickman was elected to the American Society for Clinical Investigation. He also served on the Editorial Board of the *Journal of Lipid Research* and was a member of the National Scientific Advisory Board of the National Foundation for Ileitis and Colitis. Dr. Glickman spent a month as a Visiting Professor at the Hadassah Medical Center in Jerusalem, Israel. Dr. Glickman was selected to direct the American Gastroenterologic Association Postgraduate Course in Gastroenterology.

General Medicine Division

Teaching

The faculty of the Division of General Medicine (DGM) was enlarged by the addition of Drs. Jeffrey L. Lichtenstein, Constance M. Park, and Howard R. Steinberg. The fourth year medical student elective in ambulatory internal medicine was revised to include a recurrent sequence of lectures on "Common Problems in Medical Management." A General Medicine Conference was added to the weekly department teaching schedule.

A new and fully subscribed elective course was introduced for first year medical students entitled "Introduction to Emergency Medicine." Co directed by Drs. Kenneth C. Fine and Richard Collins (St. Luke's), this elective included basic instruction in cardio-pulmonary resuscitation (CPR) and first aid, supervised periods of observation in the emergency rooms at Harlem, Presbyterian Roosevelt and St. Luke's Hospitals, and seminars on major issues in provision of emergency care services.

In the Group Clinics at Presbyterian Hospital, Physician-in-Charge was assigned to each Group Clinic on a daily basis, to provide housestaff teaching, supervision, and administrative assistance.

Clinical Activities

DGM faculty members formed a new group practice entity, Associates in Internal Medicine (A.I.M.), located on the second floor of Vanderbilt Clinic. A.I.M. provides ongoing internal medicine

primary care to approximately one-third of all patients enrolled in the Medical Primary Care Clinics. A.I.M., which has its own Board of Managers and business management specialist, represents a concerted effort to provide high quality ambulatory care services to patients in Vanderbilt Clinic.

Research Activities

Drs. Michael M. Stewart and Kenneth C. Fine, together with Allen S. Ginsberg, Ph.D. of the Center for Community Health Systems and other members of the Columbia Affiliated Hospitals Emergency Care Project supported by Josiah Macy, Jr. Foundation, extended the activities of the Columbia Emergency Care Task Force. Their studies of emergency care in four Columbia-affiliated hospital settings in Manhattan have included quality of care assessment, cost-analysis of ER operations, and analysis of differential personnel assignments in the ER's of the four participating hospitals.

Dr. Mary E. Charlson continued her research on the prognostic staging of patients with breast cancer. Dr. Jeffrey Lichtenstein presented a paper on "An Evaluation of the Clinical Efficacy of Panendoscopy in Chronic Abdominal Pain" at the 1978 National Meeting of the Clinical Scholars Program. Dr. Howard R. Steinberg has continued his work on analysis of fiberoptic upper GI endoscopy in California. Dr. Constance Park completed a study of the role of glycosylated hemoglobin in various thyroid disorders. She is currently investigating the comparative utility of measuring levels of blood glucose and glycosylated hemoglobin in the long-term management of patients with diabetes mellitus. Dr. Oliver Fein has undertaken a series of applied studies focusing on determinants of patient utilization of ambulatory primary care services.

Honors

Dr. Michael Stewart was appointed to the Health Advisory Resources Committee of the New York State Department of Correctional Services. Dr. Stewart served as a consultant to the National Center for Health Services Research, and was appointed to the Policy Advisory Committee of the International Health Section of the American Public Health Association.

Dr. Kenneth Fine was active on various committees of New York's Emergency Medical Services system (EMSS) project, funded by DHEW to improve the New York City system of emergency medical care.

Hematology Division

Clinical Activities

The Division, in cooperation with the Oncology Division, implemented a fully integrated post-doctoral Hematology/Oncology training program which recognizes the interdependence of these two medical disciplines.

Research Activities

Dr. Richard A. Rifkind, in collaboration with Dr. Paul A. Marks, studied the relationship between cell division and the initiation of erythropoietic differentiation in a murine leukemia cell. Dr. Marks, with Dr. Masaaki Terada (Human Genetics and Development) examined the nature of structural changes in chromatin and DNA during this process of induced differentiation. Together these studies are exploring the mechanisms regulating differentiation of leukemic cells. With Dr. Abdul Mojab, Dr. Rifkind explored the chemical control of minor hemoglobin synthesis as a potential approach to modifying the pathophysiology of human hemoglobinopathies and thalassemia.

Dr. Arthur Bank, in collaboration with Drs. J. Gregory Mears and Francesco Ramirez (Human Genetics and Development) continued studies of normal and abnormal human hemoglobin biosynthesis, demonstrating the organization and structure of human globin genes by direct DNA mapping techniques. They observed that the δ and β globin genes are approximately 7,000 nucleotides apart, and each is interrupted by a 1,000 nucleotide sequence within the structural gene. Certain thalassemias and related disorders are associated with the deletion of specific DNA fragments.

The Thrombosis Research Group continued to develop and apply new tests for thrombotic disease. Drs. Robert E. Canfield and Vincent P. Butler, Jr. developed antibodies specific for the 54 amino acid polypeptide which cross-links the C-terminal ends of the gamma chains of fibrin thus providing the basis for an assay for Factor XIIIa action *in vivo*. Drs. C. Liu, Hymie L. Nossel, and Karen L. Kaplan studied thrombin binding to fibrin. The two normal moderate affinity binding sites are grossly defective in fibrin from fibrinogen New York I, suggesting an explanation for the thrombotic tendency in this disorder. Drs. Karen L. Kaplan, Arthur Chernoff, DeWitt Goodman, and Ms. Barbara Linder have found that platelet factor 4, beta thromboglobulin, fibrinogen, and the platelet-derived growth factor for smooth muscle cells are all concentrated in the platelet alpha granule fraction. Drs. Jeffrey Wasser, Kaplan, Canfield, and

Nossel described a regular sequence of changes during *in vivo* coagulation characterizing fibrin I formation and plasmin action which may determine thrombus formation. Dr. Harold S. Ballard continued his work on platelet dysfunction in myeloproliferative disorders and has examined the nature of hemostatic changes in sickle cell disease.

Dr. Paul A. Marks continued his research program on studies of protein biosynthesis and the regulation of expression of erythroid characteristic genes during the induced differentiation of erythroid cells. Work is being conducted to define factors which affect the onset and rate of synthesis of marker genes characteristic of the differentiated state of these virus-infected cells.

Honors

Dr. Paul A. Marks and Dr. Richard A. Rifkind served as Editor and Associate Editor of *Blood*, the Journal of the American Society of Hematology. Dr. Marks continues to serve as a member of the President's Cancer Panel.

Dr. Karen L. Kaplan was awarded a Senior Investigatorship of the New York Heart Association.

Dr. Hymie L. Nossel was elected to the Council of the International Society for Hemostasis and Thrombosis.

Hormonal and Metabolic Disorders Division

Research Activities

Several clinical research studies were conducted by members of the Division with the assistance of Miss Delia Baquiran, who joined the Division as Clinical Coordinator for Research Programs. Drs. Robert E. Canfield, Thomas P. Jacobs and Ethel S. Siris have continued studies of the therapy of Paget's disease of bone utilizing the diphosphonate, ethane-1-hydroxy-1, 1-diphosphonic acid, in various treatment regimens. Over 60 patients with this disease are under treatment. This group comprises one of the largest clinical research studies of this disorder in the country. In addition, studies with an analog, dichloromethylene diphosphonate, have been initiated in an effort to block bone resorption in various neoplastic diseases. Preliminary results of a study, begun in collaboration with Drs. Elliot F. Osserman and William Sherman, suggest that this compound is effective in blocking the accelerated bone resorption in multiple myeloma. Drs. John P. Bilezikian and Elizabeth Shane are also employing this agent in an effort to determine whether selective blockade of bone resorption in primary hyperparathyroidism will produce a chemical remission in this disorder. Dr. Bilezikian, in collaboration with Drs. Canfield,

Jacobs and Anne P. D'Adamo, demonstrated that 1α , 25-dihydroxyvitamin D, the active metabolite of vitamin D, rapidly increases in response to a mild decrease in the serum calcium concentration of human subjects. The kinetics of the increase in 1α , 25-dihydroxyvitamin D are consistent with regulation either by parathyroid hormone or phosphate. These clinical research activities of the Division involved 49 hospital admissions for a total of 306 patient days as well as 332 outpatient visits to the General Clinical Research Center.

Drs. Steven Birken and Canfield, in collaboration with Dr. Iving Boime at Washington University in St. Louis, studied the precursors of hormone molecules synthesized by the syncytiotrophoblast cells of the placenta. Precursor forms of human placental lactogen and of the alpha subunit of human chorionic gonadotropin were isolated and portions of their structures identified. Drs. Birken and Canfield along with Dr. Biswajit Lahiri and Mrs. Joan H. Sobel also succeeded in isolating components of human fibrin that are involved in crosslinking reactions. These latter activities are a part of a larger thrombosis research program that is being conducted in the Department under the overall direction of Dr. Hymie L. Nossel.

Dr. Bilezikian completed a number of inquiries into the mechanisms of beta receptor function in certain model systems. In the turkey erythrocyte, detailed analyses of adrenergic amines and their receptors was conducted with respect to both structure and to activity. Specific structural requirements for occupation of beta receptor sites were compared directly with the requirements for the activation or inhibition of adenylate cyclase. In another model system, the rat erythrocyte, further understanding of the uncoupling that occurs between beta receptors and adenylate cyclase during differentiation was gained. In collaboration with Dr. Michael Schonberg (Neurology), Dr. Bilezikian completed studies related to the role of beta-adrenergic catecholamines in myogenesis. In another area, Dr. Bilezikian and Dr. John Loeb completed their initial studies into the role of beta adrenergic receptors in the altered adrenergic tone associated with hyperthyroidism and hypothyroidism.

Honors

Dr. Robert E. Canfield was invited to present papers at the National Academy of Science Symposium on Contraceptive Technology, at the New York Academy of Medicine Symposium on the Aging Skeleton and at the Gordon Conference on Thrombosis and Haemostasis. In addition, Dr. Canfield served on the NIH Study Section for Endocri-

nology Training Grants and on the Scientific Advisory Committee of the Hirschl Trust. He also was elected to membership in the Association of American Physicians.

Immunology Division

Teaching

The participation of four new faculty members, Doctors Benvenuto Pernis, Leonard Chess, James Halper and Steven Friedman added new breadth and strength to the teaching of immunology to second-year medical students in the Abnormal Human Biology course.

Research Activities

Dr. Vincent P. Butler, Jr. completed a study of the effects of Fab fragments of digoxin-specific antibodies on the renal excretion of digoxin in dogs. Dr. Edward B. Leahey, Jr., Dr. J. Thomas Bigger, Jr., Dr. James A. Reiffel, and Dr. Butler are studying the effect of quinidine on the renal excretion of digoxin in man and in dogs. Dr. William J. Ball, Jr. U.S.P.H.S. Trainee in Immunology, Mrs. Doris Tse Eng and Dr. Butler are studying the effect of quinidine on the binding of digoxin by human erythrocytes and by isolated canine renal Na⁺, K⁺-adenosinetriphosphatase preparations. Dr. Butler and Dr. John Lindenbaum extended their studies with a radioimmunoassay for dihydrodigoxin, a metabolite of digoxin. Dr. Rose M. D'Alisa, Dr. Lindenbaum and Dr. Butler have initiated studies of antibodies to vitamin K. Dr. D'Alisa and Dr. Butler, together with Doctors Biswjit Lahiri, Stephen Birkin, and Robert E. Canfield are developing a radioimmunoassay for the cross-linked carboxyl terminal end of the gamma chain of human fibrin. Doctors D'Alisa and Butler, together with Dr. Hymie L. Nossel, are studying the effects of elastase and of chymotrypsin on human fibrinogen. Dr. Tuan D. Pham is developing methods for the immunoelectron microscopic localization of human platelet proteins.

Honors

Dr. Vincent P. Butler, Jr. was an invited lecturer at the International Congress of Pharmacology in Paris, France.

Infectious Disease Division

Teaching

In the second year the Infectious Disease section of Abnormal Human Biology is organized and taught by the Division. An elective, fully subscribed, is offered

at Presbyterian Hospital for four senior students who make daily rounds with attendings, fellows and residents. Senior students also can take an elective at Hackensack Hospital with Dr. Peter A. Gross or at Stamford Hospital with Dr. Michael F. Parry.

The regional meeting of The American College of Physicians was on Infectious Diseases. Dr. Harold C. Neu was scientific chairman. Drs. Garvey, Neu, Parry and Weissman all gave presentations. The Division sponsored two symposia on antimicrobial agents— β -lactam antibiotics—and each had an attendance of 150-200 individuals. Continuing Medical Education (CME) credit for each was seven hours. All of the members of the Division gave lectures at community hospitals in the Eastern United States as part of CME programs.

Research Activities

Dr. Peter A. Gross, Hackensack Hospital, in collaboration with Dr. William Davis (Pediatrics), Drs. Hylan Bickerman and John Rodgers (Medicine), conducted a study of the feasibility of immunizing individuals who had not received previous influenza vaccines with one dose of influenza vaccine. Dr. Gross also studied the efficacy of a new parenteral cephalosporin, cephalosporin cefamandole, in bone and joint infection.

Drs. Peter A. Gross, Harold C. Neu, Naline Aswapokee and Prasit Aswapokee completed a study of the epidemiology of deaths due to nosocomial infections at CPMC and a community hospital—Hackensack Hospital. The study revealed that although nosocomial urinary infections are the most common infections encountered, acquired respiratory infections produce the greatest morbidity and mortality.

Dr. Michael F. Parry, Stamford Hospital, has been investigating the clinical significance of myeloperoxidase deficiency in otherwise normal patients with Dr. R. Root (Yale). Dr. Parry has also been investigating the epidemiology of *Citrobacter diversus* infections in neonatal care areas.

Drs. Kwung P. Fu and Harold C. Neu studied the resistance to β -lactam antibiotics of *Legionella pneumophila*—the organism which causes Legionnaire's Disease. They showed that organisms from the major outbreaks contained a new type of β -lactamase with primary affinity for cephalosporin antibiotics.

Drs. Fu and Neu undertook a series of studies of the kinetics of inhibition of β -lactamases produced by *Enterobacteriaceae*. They defined the β -lactamase types which could be inhibited by clavulanic acid and by a penicillanic sulfone, CP-45, 899. Studies of Drs. N. Aswapokee and Neu showed that these com-

pounds made plasmid carrying *S. aureus*, *H. influenzae*, *Neisseria*, members of the *Enterobacteriaceae*, such as *E. coli*, *Klebsiella*, *Salmonella* and even *B. fragilis* susceptible to ampicillin or cephalothin to which the organisms had become resistant.

Drs. Aswapokee, Fu and Neu investigated the *in vitro* activity of a series of new penicillins and cephalosporins. The group showed that antipseudomonas activity could be achieved with modification of the cephalosporin nucleus, but that this activity was highly dependent upon assay conditions.

Clinical studies carried out during the year with the aid of the Medical and Surgical housestaff were the evaluation of mezlocillin and cefaclor. Drs. Stephen J. Pancoast, David Hyams and Neu studied the effect of trimethoprim and trimethoprim-sulfamethoxazole upon the vaginal and rectal flora of women receiving the agents in a double-blind study. It was shown that both programs eliminated *Enterobacteriaceae* from the stool and periurethral areas. Concentrations of both compounds were present in vaginal secretions. Use of trimethoprim as a single agent did not result in selection of drug resistant flora in the intestine.

Drs. P. Aswapokee, Ellner (Microbiology) and Neu reviewed the incidence of drug-resistant *Mycobacterium tuberculosis* isolated at CPMC in the past 8 years. There has been the appearance of multiple-drug-resistant strains, including to rifampin. The multiple drug resistant *M. tuberculosis* were isolated from those who had undergone previous treatment and had a history of poor drug compliance.

Drs. Gerald B. Appel, Elliot L. Francke and Neu studied the effect of hemodialysis upon the pharmacokinetics of amoxicillin.

Drs. P. Aswapokee, Fu and Neu determined the human pharmacokinetics of a new antipseudomonas cephalosporin, HR 756.

Drs. Alice S. Prince and Neu reviewed all of the patients seen at CPMC with *Haemophilus influenzae* meningitis and showed that administration of liberal fluids did not lead to any more complications than did those fluid restricted.

Honors

Dr. Harold C. Neu joined the Editorial Board of *The Journal of Antimicrobial Chemotherapy*, the Journal of the British Society for Antimicrobial Chemotherapy. He chaired an international symposium via satellite television on Hospital-Associated Infections. He was the guest speaker at the North Carolina Academy of Medicine and participated in the Antibiotic-Infectious Diseases symposia at Emory, Tulane and Harvard. He was on the organizing committee of the NIH Conference on Fu-

ture Developments in Training and Research in Infectious Diseases held at the NIH. Dr. Neu spoke before the Japanese Chemotherapy Society in Tokyo. He was chairman of an international conference on chemotherapy at the Royal Society of Medicine in London. Dr. Neu was chairman of the advisory committee of the CDC to write new guidelines for the therapy of gonorrhoeae.

Metabolism and Nutrition Division

Teaching

A new postdoctoral education program began July 1978, with support from a new Postdoctoral Training Grant in Arteriosclerosis Research from the National Heart, Lung, and Blood Institute. The aim of this training program is to develop laboratory and clinical investigators who are broadly knowledgeable about the major disciplines and directions in arteriosclerosis research, and who are able to carry out independent research within this field. In order to achieve this aim, trainees will receive interdisciplinary research training that will include didactic elements (tutorials, seminars and formal courses) and supervision in the conduct of research. Areas of investigation will be in lipid and lipoprotein metabolism, hyperlipidemia, platelet and coagulation biochemistry and disease, biomathematics and computer modeling, regional myocardial blood flow and the coronary circulation, and electrophysiology and arrhythmias. The Program Director is Dr. DeWitt S. Goodman, and the major participants include Drs. J. Thomas Bigger, Conrad B. Blum, Paul J. Cannon, Ralph B. Dell, and Hymie L. Nossel.

Research Activities

Dr. DeWitt S. Goodman and his colleagues in the Division of Metabolism and Nutrition continued to conduct major research activities in the fields of lipid metabolism, arteriosclerosis, and the fat-soluble vitamins A and D. During 1978 active progress was made in projects dealing with: cholesterol turnover and metabolism in man; lipoprotein and apolipoprotein metabolism in man; platelet-derived growth factor and growth regulation of human arterial smooth muscle cells; the metabolism and transport of vitamin A; and the transport of vitamin D and 25-hydroxyvitamin D in human plasma.

Studies on cholesterol turnover and metabolism in normal persons and in patients with hyperlipidemia have been continued by Drs. Robert H. Palmer, Ralph B. Dell (Pediatrics), R. Ramakrishnan, Frank R. Smith, and Alan H. Seplowitz. The objectives of this project are to describe the parameters of chole-

terol metabolism in patients with different kinds of hyperlipidemia, in order to determine whether and how such patients differ from each other and from normal subjects with regard to these parameters. Longterm studies (32-49 weeks) of the turnover of plasma cholesterol have been completed and fully analyzed in fifty-four subjects (15 normals, 10 with hypercholesterolemia alone, 21 with hypertriglyceridemia alone, and 8 with combined hyperlipidemia). In every subject a simple three-pool model developed previously in this laboratory gave the best fit for the data. Using this model, a great deal of information has been obtained about cholesterol metabolism in intact humans. This project also aims to define in quantitative terms the effects on body cholesterol metabolism of drug therapy for hyperlipidemia. Studies are also in progress to explore relationships between turnover of cholesterol in plasma and in various tissues.

A new program of research on the metabolism of the plasma lipoproteins and apolipoproteins is being developed by Dr. Conrad B. Blum. The goals of this research are to obtain detailed information about the metabolism of the various plasma apolipoproteins in normal and in hyperlipidemic humans, and to delineate normal and abnormal metabolic interrelationships between the different apoproteins and lipoproteins. During the past year progress has been made on the development of immunochemical methods for the assay and study of the different plasma apolipoproteins. Information is also being collected on the relationships between HDL apoprotein levels and the parameters of body cholesterol metabolism.

Blood platelets contain a growth-promoting factor that appears to play a key role in the formation of the early lesions of atherosclerosis. A project to study this platelet-derived growth factor (PDGF), has been conducted by Drs. Arthur Chernoff, Goodman, and Ms. Barbara Linder (an M.D.-Ph.D. student), in collaboration with Drs. Hymie L. Nossel, Karen Kaplan, and Harvey J. Weiss. It was found that PDGF and other constituents of the platelet α -granules (platelet factor 4 and β -thromboglobulin) can be released from platelets specifically by arachidonic acid, and that this specific release is suppressed by indomethacin. Thus, PDGF release apparently involves a prostaglandin-related pathway, most probably involving the platelet cyclooxygenase and conversion of arachidonate to prostaglandin metabolites. These studies of the mechanisms involved in PDGF release, and of their regulation, should add to our basic understanding of the atherogenic process.

Studies dealing with the metabolism and transport

of vitamin A have been conducted by Drs. John E. Smith, A. Catherine Ross, Noriaki Adachi, and Goodman. Major efforts have continued to focus upon plasma retinol-binding protein (RBP), the specific transport protein for vitamin A. RBP serves to transport vitamin A from its body stores in the liver to the many peripheral tissues that require vitamin A in order to maintain their differentiated structure and function. Mobilization and delivery of vitamin A are controlled by factors that regulate the production and metabolism of RBP. A major objective of this research is to elucidate the mechanisms involved in the regulation of RBP production and secretion by the liver. In order to explore these mechanisms, Dr. John E. Smith is studying in detail the events that occur in the liver cell during RBP production and secretion. Studies have been carried out on the role of the Golgi apparatus, of microtubules, and of smooth vs rough endoplasmic reticulum in RBP metabolism. Studies are also being carried out on the structure and properties of microsomal RBP in rat liver, and on RBP production in isolated liver cells in culture in collaboration with Dr. Carmia Borek (Radiology). A related study, dealing with the enzymatic hydrolysis of vitamin A esters in liver, is being conducted by Ms. Janet Prystowsky (a graduate student in the Institute of Human Nutrition). Finally, a project aiming to examine some of the events that occur in peripheral tissues after vitamin A delivery, by studying intracellular binding proteins for vitamin A, is in progress (Drs. Adachi, Ross and Goodman). Soluble proteins with binding specificity for either retinol (vitamin A alcohol) or retinoic acid have been isolated from the cytosol of rat testis homogenates. These proteins are of low molecular weight (approx. 15,000), and are distinct from serum RBP in immunochemical and other properties. The properties of these interesting proteins are being characterized in detail, and their possible physiological roles in modulating the biochemical expression of vitamin A activity inside cells will be explored. Finally, it might be noted that these studies are potentially relevant to a major research effort that is developing in this country and in Europe, to explore the use of vitamin A-related compounds (collectively termed retinoids) in the prevention of epithelial cancers in high risk patients.

Studies of the transport of vitamin D and 25-hydroxy-vitamin D have been carried out by Dr. Masanobu Kawakami. This project aims to examine in detail the plasma protein, called DBP, that is responsible for the transport of vitamin D and its metabolites in human plasma. Information has been obtained about the comparative affinity of DBP for various vitamin D metabolites, and about the com-

parative binding properties of different genetic variants of DBP. Other characteristics of DBP are under investigation.

The studies on lipid metabolism and atherosclerosis in the Division of Metabolism and Nutrition comprise a major part of the program of the Specialized Center of Research (SCOR) in Arteriosclerosis at the Columbia-Presbyterian Medical Center. This Center represents one of eight such Arteriosclerosis Centers in the U.S.A., established and supported by SCOR grants from the National Heart, Lung, and Blood Institute in Bethesda, Md. The Columbia Arteriosclerosis Research Center comprises a multidisciplinary program of basic and clinical research directed at major questions in the areas of lipid metabolism, hyperlipidemia, atherosclerosis, thrombosis, and coronary heart disease. A central focus of this SCOR is the detailed and extensive study of patients with hyperlipidemia. Patients are seen and studied in a core clinic in the Atchley Pavilion, directed by Dr. Robert H. Palmer, that serves as an outpatient facility for clinical investigation of patients with hyperlipidemia. During the past year additional funds totalling \$759,000 were awarded to this SCOR by the NHLBI, in order to expand its program, bringing the 5 year total research funding to over \$3.1 million. These supplemental funds will support research on plasma lipoproteins and apolipoproteins being carried out by Drs. Robert M. Glickman, Alan R. Tall, and Blum. Other SCOR projects include a study of incisions of intravascular coagulation and thrombosis in patients with hyperlipidemia, being carried out with Drs. Nossel and Kaplan, and studies of regional myocardial perfusion in patients with coronary atherosclerosis, being carried out by Dr. Paul J. Cannon and his associates.

Honors

Dr. DeWitt S. Goodman was elected Vice Chairman of the Council on Arteriosclerosis of the American Heart Association, and served as a member of the Executive Lung Team Planning and Public Policy, and Credentials Council. He also served as a Counsellor of The Harvey Society, Chairman of the Task Force on Lipid Metabolism of an on-going NIH Evaluation of Endocrinology and Metabolic Diseases, and as a member of the Lipid Metabolism Advisory Committee of the National Heart, Lung and Blood Institute. He continued on the Advisory Boards of the *Journal of Lipid Research* and the Deuel Conference on Lipids. Dr. Goodman was the Principal Guest of St. Vincent's Hospital Medical School in Melbourne and the Distinguished Visitor at the annual meeting of the Australian Atherosclerosis Group.

Dr. Robert H. Palmer served as a member of the Subcommittee on Research of the National Commission on Digestive Diseases. He participated in work-groups dealing with Surveillance of Research Potential and Needs and Clinical Research and Digestive Disease Centers and Specialized Facilities. He edited the chapters on Liver Diseases and Diseases of the Gall bladder and Biliary Tract in the Report to Congress by the Subcommittee on Research. Dr. Palmer also served the American Gastroenterological Association as Chairman of the Program Evaluation Committee (1973-1978) and as Chairman of the Nominating Committee (1978).

Nephrology Division

Teaching

Dr. Qais Al-Awqati was appointed Director of the division, and Drs. Fred Polsky and Gerald Appel joined the division. The renal section of Abnormal Human Biology was revised and a new syllabus was prepared. Teaching of the senior student elective in Nephrology was supplemented by didactic sessions on renal pathophysiology and clinical nephrology. A new journal club organized by Dr. Al-Awqati and Dr. Hugh Nellans (Gastroenterology) served as a focal point for investigations in epithelial transport in the institution. Dr. Jay Meltzer participated in the postgraduate course "Renal Biopsy" given by the Department of Pathology.

Clinical Activities

Dr. Appel, Medical Director of Renal Dialysis instituted numerous changes in the Dialysis Unit in order to facilitate the delivery of high quality care to patients with both acute and end stage renal disease.

Research Activities

Dr. Al-Awqati continued his studies on the basic mechanisms of active transport in urinary epithelial membranes. Drs. Troy E. Dixon and Al-Awqati identified the biochemical nature of the hydrogen ion (H^+) pump in the turtle urinary bladder (an epithelium serving as the model for urinary acidification). They found that the H^+ pump is a reversible proton-translocating ATPase. Numerous similarities between this pump and the ATP synthetase of mitochondria, bacteria and chloroplasts were identified.

Drs. Herbert Chase and Al-Awqati investigated the mechanisms regulating active sodium transport in the toad urinary bladder. They developed methods to study the sodium permeability across the urinary surface of the epithelial cell, the rate-limiting step in the movement of sodium across the epithelium.

Dr. Appel studied the pharmacokinetics of newer penicillins in renal failure. He also continued his work on gentamicin nephrotoxicity.

Dr. Juan Oliver initiated studies to determine the role of renal prostaglandins and their interaction with the sympathetic nervous system in regulating renal blood flow. He also studied the mechanisms by which renal blood flow is kept constant during low salt intake and enhanced renin activity. The role of prostaglandins in this area was also investigated. A new clinical study on the mechanisms that return blood pressure to normal after reversal of renal artery stenosis was begun. Percutaneous dilation angioplasty will be attempted and the response of blood pressure, glomerular filtration, blood flow, renin and prostaglandin to relief of stenosis will be tested.

Drs. Fred Polsky and Isidore S. Edelman (Biochemistry) started work on the organization and expression of the genes that encode Na-K-ATPase. Thyroid hormone induces the Na-K-ATPase gene and its mechanism of action.

Dr. Meltzer joined Dr. Schoenberg's (Psychiatry) group in the study of ethical problems in medicine as they relate to dialysis and transplantation. Methods for analysis of value conflicts are being developed.

Oncology Division

Teaching

Dr. Rose Ruth Ellison (Director) and Dr. Esteban Cvitkovic joined the Oncology Division during the year. A new elective, a subinternship in oncology on PH 4 East, is now offered. Twice-weekly teaching rounds were instituted on 4E as well as a weekly oncology clinic conference. These supplement the weekly oncology conference which permits more formal presentations.

Dr. I. Bernard Weinstein organized the Oncology Section of the second year Abnormal Human Biology course in which many members of the division participated.

Clinical Activities

Protocols were developed for treatment of many types of cancer. These studies were planned and undertaken by the medical oncologists working with surgeons and radiotherapists. A new study of extensive combination chemotherapy for "poor prognosis" ovarian carcinoma was just initiated. Other protocols used for the treatment of solid and hematologic malignancies are those of the Cancer and Leukemia Group B. Drs. William Sherman, Martin Oster, Johan Raafat and Esteban Cvitkovic were involved in these studies. Dr. Sherman assumed

administrative responsibility for the clinical cancer research facility on PH 4E. Dr. Raafat supervised the activities of the medical oncology clinic.

Research Activities

Dr. Ellison is currently analyzing the natural history of acute myelocytic leukemia in a large group of patients treated in the CALGB. She is seeking to identify characteristics of those patients surviving for long periods in continuous remission. She is also chairing a study comparing two schedules of adriamycin administration for advanced soft tissue sarcoma. Dr. George Hyman is studying the use of orthoradiography for diagnosis of precancerous oral lesions.

Dr. Weinstein and his associates continued their studies on the molecular and cellular events in chemical carcinogenesis. Together with Dr. Alan Jeffrey (School of Public Health, Division of Environmental Sciences) and Dr. Koji Nakanishi (Chemistry Department), he has obtained further information on the chemical structures of DNA and RNA adducts formed in human, bovine and rodent tissues exposed to the ubiquitous environmental carcinogen, benzo(a)pyrene. Studies done in collaboration with Dr. Dezider Grunberger (Institute of Cancer Research and Department of Biochemistry) have elucidated conformational and functional alterations in nucleic acids modified by the carcinogens N-2-acetylaminofluorene (AAF) or benzo(a)pyrene. Cell culture studies revealed new biological effects of the phorbol esters, an extremely potent class of tumor promoting agents. These include: 1) mimicry of transformation in normal cells, 2) enhanced expression of markers of transformation in tumor cells, and 3) enhancement of carcinogen or virus initiated cell transformation. These results provided new insights into the multiple factors and multiple steps involved in the action of environmental carcinogens.

Dr. Sherman's projects included 1) attempts to isolate and identify a presumed ligand from a monoclonal immunoglobulin and rebind it to the Fab protein of the immunoglobulin; 2) further evaluation of the natural history of myeloma and the effects of chemotherapy and dichloromethylene disphosphate on the osteolytic process of myeloma; and 3) improving the computer-based case tracing system for use in following any chronic illness.

Dr. Raafat analyzed the characteristics of a group of patients with cutaneous T cell lymphomas.

Honors

Dr. Rose Ruth Ellison continued as Vice President for Medical and Scientific Affairs, Leukemia Society

of America, Inc. She was also a member of the Board of Directors of the American Association for Cancer Research and a member of the Board of Scientific Advisors of the Division of Cancer Treatment, National Cancer Institute. She joined the Editorial Board of *Blood* and the Board of Editorial Consultants of the *American Journal of Medicine*.

Dr. I. Bernard Weinstein was elected to the Institute of Medicine of the National Academy of Sciences. He was also appointed to the Scientific Advisory Board of the International Agency for Research on Cancer of the World Health Organization and the Board of Scientific Counselors, Division of Cancer Cause and Prevention, National Cancer Institute.

Dr. Martin W. Oster continued as a Junior Faculty Clinical Fellow of the American Cancer Society.

Pulmonary Division

Clinical Activities

The annual increase in pulmonary function tests and fiberoptic bronchoscopies continued. There was an increment of 9% in each of these diagnostic procedures.

Research Activities

Dr. Norma M.T. Braun collaborated with Dr. Dudley F. Rochester of the University of Virginia in a study of respiratory muscle function. They have been able to establish the length-tension relationships of the normal human diaphragm. Dr. Braun also investigated patients with myopathies to determine the role of respiratory muscles in the development of respiratory failure and showed that weakness of these muscles may contribute to hypercapnia. Early diagnosis of muscle impairment and the use of intermittent mechanical ventilation may prevent the appearance of respiratory failure.

Dr. Hylan A. Bickerman with Dr. John M. Rodgers continued their studies on the mechanics of respiration employing flow volume tracings and body plethysmography. They collaborated with Dr. Braun in special studies on a number of patients. The effectiveness of antitussive agents in cough caused by a variety of acute and chronic respiratory disorders is being investigated by the analyses of tape recordings and computer analyses. Dr. E. Leslic Chusid of the Mt. Sinai Medical School is collaborating in these studies.

Dr. Randolph P. Cole and Dr. Peter R.B. Caldwell collaborated with Drs. Beatrice A. Wittenberg and Jonathan B. Wittenberg (Albert Einstein College of Medicine) to study the role of myoglobin in intracellular oxygen transport in cardiac and skeletal muscle tissue. These investigations have im-

portant implications for understanding how hypoxia impairs muscle performance.

Dr. Caldwell, Dr. Vincent P. Butler and Dr. Rose D'Alisa, Division of Immunology, studied the binding and anticatalytic properties of antibodies to angiotensin converting enzyme. Dr. Caldwell, Dr. H. Joachim Wigger (Pathology), Dr. Beatrice Seegal (Microbiology) and Dr. Konrad Hsu (Microbiology) investigated the ultrastructural localization of converting enzyme. These studies are designed to improve understanding of mechanisms of regulation of blood pressure and blood volume.

Drs. Yale Enson, Réjane M. Harvey, Henry M. Thomas III and John A. Wood continued an examination of the relation between disturbances in lung function and abnormalities of the pulmonary circulation in patients with chronic, diffuse interstitial lung diseases. Patients whose clinical deterioration did not seem related to progression of the interstitial process were studied. Unexpectedly, the severity of pulmonary hypertension encountered in these subjects was substantially greater than would have been predicted on the basis of the relation between pulmonary arterial pressure and lung volume previously described by the group. On this basis the presence of intercurrent thromboembolic complications was postulated, and subsequently confirmed, in each case. These observations may serve as the basis for identification of a life-threatening complication of chronic lung disease hitherto refractory to diagnostic evaluation. Dr. Thomas also investigated the effect of alveolar hypoxia on gas exchange in normal dogs. He found that alveolar hypoxia alters the distribution of perfusion relative to ventilation in a manner which further lowers arterial oxygen tension. Abnormalities of the chest roentgenogram in patients with interstitial diseases were evaluated in collaboration with Dr. John H.M. Austin (Radiology). Redistribution of pulmonary blood flow from the lung base to apex was identified with increasingly severe interstitial abnormalities. This alteration in lung perfusion could not be ascribed to either the regional distribution of the radiographic abnormalities or to the level of pulmonary arterial pressure. The cause of this diversion of blood flow is not clear. The observation, however, suggests that the forces responsible are far smaller than currently accepted models of the central circulation indicate would be necessary. Semiquantitative criteria were elaborated, in collaboration with Drs. William A. Blanc and H. Joachim Wigger (Pathology), for scoring the severity of parenchymal and vascular lesions observed in lung biopsies obtained from patients with interstitial lung diseases. The severity of parenchymal disease did not correlate with the level of lung function observed in each patient. In

contrast, the severity of the vascular lesions did correspond to the level of pulmonary arterial pressure. Biopsy specimens reflected the overall behavior of the lung with respect to vascular, but not to parenchymal, abnormalities.

Dr. Gerard M. Turino with Drs. Michael J. McNamee, Stephen Keller (Obstetrics & Gynecology) and Ines Mandl (Obstetrics & Gynecology) began to measure the effects of various stimuli to alveolar macrophage elastase production in animals and man. This enzyme may play a role in lung elastin destruction leading to pulmonary emphysema in man. Along with the effects of tobacco smoke, agents such as thioglycollate and colchicine are being used to determine maximum capacities for synthesis of elastase while adrenal corticosteroids are being studied for suppression of alveolar macrophage elastase synthesis.

Dr. Bonnie A. Bray with Dr. Turino determined the presence of "cold-insoluble globulin" in an endothelial cell culture preparation from rat lung. This observation is consistent with previous work in which Dr. Bray showed the presence of "cold-insoluble globulin" in lung basement membrane where it may play a role in permeability. The capacity of other cells in lung parenchyma to synthesize "cold-insoluble globulin" is being investigated.

Dr. Jerome O. Cantor (Pathology) with Drs. Bray, Karl Meyer (Biochemistry), Dr. Stephen F. Ryan (Pathology) of St. Luke's Hospital, and Turino have shown increases in lung parenchymal glycosaminoglycans as a function of cell repair in experimentally induced pulmonary fibrosis produced by N-nitro-n-methylurethane.

Dr. S.M. Kamal Batcha with Drs. S. Alexander Stalcup (Pediatrics), Mohamed M. Osman and G.M. Turino are examining the role of prolonged hyperoxia leading to lung endothelial cell damage on the capacity of the lung to convert angiotensin I to angiotensin II and to inactivate bradykinin in a single circulation through the lung. The results of these studies are applicable to the cardiocirculatory effects of oxygen toxicity seen clinically.

Dr. Richard S. Kornbluth with Drs. Mandl, Keller, Turino and John Manahan (Obstetrics & Gynecology) are measuring collagenase enzyme activity in human alveolar macrophages freshly lavaged from lungs *in vivo* and from human alveolar macrophages in culture. Collagenase activity in alveolar macrophages and circulating neutrophils is being studied for its possible synergistic role with elastases from these cell sources in alveolar injury in human emphysema.

Drs. Arline D. Deitch (Pathology), Cantor, Mary S. Parshley and Turino are establishing lines of cells

isolated from lung parenchyma to determine the individual cell sources of lung elastin, collagen, glycosaminoglycans and fibronectin. Results thus far indicate that rat lung endothelium synthesizes crosslinked elastin. These studies are part of the larger investigation to determine mechanisms of repair of alveolar injury.

Drs. Mandl and Turino in collaboration with Roland Alexander Blackwood established a model of elastin lung injury induced by depleting levels of serum alpha₁-antitrypsin by the administration of D-galactosamine which reduces the capacity of liver to synthesize alpha₁-antitrypsin in rats. This experimental model can assess the protective effect of synthetic inhibitors of proteolysis to diminish the proteolytic effects of elastases administered intratracheally and intravenously in the experimental production of pulmonary emphysema.

Dr. Turino in collaboration with Drs. Richard M. Skalak (Civil Engineering), Maciej P. Bienick (Civil Engineering) and Joseph M. Cerreta completed a study of the effects of alterations of lung elastin and collagen induced by controlled proteolysis *in vitro* on length tension relationships of lung parenchymal strips. The contrasting mechanical effects of alterations of these two connective tissue components are providing important information with respect to the role of injuries to specific components of connective tissue in altering lung regional and overall mechanics.

Tukaram V. Darnule (Obstetrics & Gynecology) in collaboration with Drs. Mandl and Turino began to develop techniques to detect circulating degradative peptides of human lung elastin in the serum of patients with chronic obstructive lung disease. These studies are preliminary to developing a radioimmunoassay for such peptides to aid in the diagnosis of early lung destruction in pulmonary emphysema.

Honors

Dr. Bickerman served as Governor of the American College of Chest Physicians for New York. He has been requested to serve as a consultant for the 4th edition of the AMA Drug Evaluations Compendium.

Dr. Braun was Visiting Professor of Medicine, Medical College of Virginia.

Dr. Caldwell has received a John E. Fogarty Senior International Fellowship in support of a Sabbatical Leave to study at St. Mary's Hospital Medical School, University of London during 1978-79.

Dr. André F. Cournand served as a member of the International Board of M. U. R. S. (Universal Movement for Scientific Responsibility); chairman of the Board of the Foundation for the Advancement of International Research in Microbiology; member

of the Executive Committee of the Milbank Program in Health and Society at Barnard College; member of the organizing committee of the Symposium on Physics and Biology (Institute de la Vie, Paris) and as chairman of the Advisory Committee of *Man and Medicine: The Journal of Ethics and Values in Health Care*. He also served as president of the 5th European Congress of Anesthesiology and Reanimation, Paris, 11th Entretiens de Physiopathologies Respiratoire, Nancy, France, and 8th International Conference of Social Gerontology on Ecology and Aging, Casablanca, Morocco. Dr. Cournaud lectured at the Ribeirao Preto School of Medicine, State of Sao Alagoas, Brazil, and Lindau, Lake Constance, Germany.

Dr. Enson was chairman of the session on the pulmonary circulation at the Fifth European Congress of Anesthesiology, Paris. He addressed the Congress on "A Survey of Pulmonary Hemodynamics: Structure and Function in the Central Circulation." Dr. Enson was keynote speaker on "Cor Pulmonale" at the upstate New York Regional Meeting of the American College of Physicians, Albany, New York. Dr. Enson was an invited lecturer on "Hemodynamic and Pathophysiologic Factors in Pulmonary Thromboembolism" at the annual scientific meeting of the New York Trudeau Society, West Point, New York.

Dr. Harvey is a Consultant Editor to the *The American Journal of Medicine* and a member of the Executive Committee of the New York Heart Association.

Dr. Thomas served as Chairman of the Research and Professional Education Committee of the New York Trudeau Society, as a member of the Committees on Respiratory Services of the New York Lung Association and the Professional Education Committee of the American Lung Association of New York State.

Dr. Turino was elected chairman of the Respiration Section Dinner for 1979—American Physiological Society and chairman of the Pulmonary Society and chairman of the Pulmonary Circulation Section of the American Thoracic Society. He was appointed to Task Force on Effects of the Environment on Cardiovascular Health of the American Heart Association; to the Committee on Nominations of the New York Heart Association and to the Committee on Nominations and Awards of the American Heart Association.

Rheumatology Division

Teaching

The training program under the auspices of the Division of Rheumatology offered elective programs

for fourth year medical students, and senior medical residents, plus a post doctoral training program for fellows in clinical rheumatology and immunology. Teaching efforts expanded in 1978 included 1) the introduction of a series of lectures on the cellular basis of the immune response and its relation to autoimmune phenomenon, and 2) didactic and laboratory sessions in clinical immunology to familiarize students with clinical immunologic procedures including enumeration of T and B lymphocytes in peripheral blood, immunofluorescent techniques and the measurement of cell mediated immune responses *in vitro*. In addition, the division expanded its role in the teaching of the Immunology Section of the Abnormal Human Biology course.

Clinical Activities

The Division of Rheumatology coordinated its clinical programs with the Pediatric Program in Rheumatology under the direction of Dr. Jerry Jacobs so that undergraduate and graduate trainees in the Division of Rheumatology would have the opportunity to participate in the care of children as well as adults with rheumatic disease. The division also expanded its utilization of the Clinical Research Center in order to evaluate new treatment modalities in patients with systemic lupus erythematosus and to initiate detailed clinical investigative studies of patients with a variety of autoimmune diseases.

Research Activities

Dr. Leonard Chess (Director) investigated the differentiation history of human T cells with particular interest in isolating subclasses of human T cells important in the regulation of the immune response. In this regard efforts were directed to the identification of distinct and unique differentiation antigens which distinguish subclasses of lymphocytes and which may allow their identification and isolation for immunologic functional analysis. The capacity to isolate distinct populations of regulatory cells in human peripheral blood will permit greater understanding of abnormalities in the control of immune response thought to be important in the pathogenesis of a number of rheumatic diseases including rheumatoid arthritis and systemic lupus erythematosus. Interestingly, some patients with autoimmune disease have antibodies in their sera reactive with subpopulations of lymphocytes. In addition, Dr. Chess studied the functions of gene products of the major histocompatibility complex including the HLA in man. This genetic region is responsible, in part, for controlling immune responsiveness to a variety of antigens including regulation of the immune response to self determinants. Since the HLA region is known to be

associated with a variety of rheumatic diseases including ankylosing spondylitis and rheumatoid arthritis precise analysis of these genes will aid in understanding of the mechanisms involved in the pathogenesis of these diseases.

Dr. Steven M. Friedman was intimately involved in studying the mechanisms by which T lymphocytes recognize foreign or altered-self cell surface determinants and subsequently differentiate into killer cells capable of destroying these foreign cells. Moreover, Dr. Friedman studied the mechanism by which, under certain experimental conditions and in some diseases in man, these same T cells become autodestructive and destroy unaltered normal cells. In addition, Dr. Friedman is actively investigating the mechanisms by which human antibody-forming cells become unresponsive (tolerant) to given antigens. The breakdown in tolerance to one's own cells is one of the mechanisms thought to be important in the pathogenesis of some of the rheumatic and autoimmune disorders.

Dr. Jane H. Morse continued her studies of naturally occurring immunosuppressive factors in plasma. In collaboration with DeWitt Goodman and Larry Witte, she demonstrated that all normal classes of lipoproteins in physiological concentrations inhibit lymphoproliferation *in vitro*. Experiments are now underway to further dissect the chemical and immunological requirements of lipoprotein regulation of the immune response. In addition, Dr. Morse studied the influences of age, sex and strain on mitogen induced lymphoproliferation in mice with autoimmune disease. In collaboration with Dr. Steven I. Morse (Chairman of Microbiology, Downstate Medical Center) Dr. Morse purified a lymphocytosis promoting factor from *B. pertussis* which triggers the proliferation of human and murine lymphocytes. This factor may be important in the lymphocytosis which may occur during the course of some autoimmune diseases.

Dr. Dorothy Estes, in collaborations with Drs. Gail Williams, Jay I. Meltzer, Conrad L. Pirani and Fred G. Silva, continued to study the relationship of renal biopsies to the clinical course of patients with systemic lupus erythematosus and nephritis and found that the overwhelming majority, if not all patients, with systemic lupus had evidence of renal abnormalities in early stages of their disease and that certain patterns of pathology seen, either by immunofluorescence, electron microscopy or light microscopy had prognostic significance. In collaboration with Dr. Eng Tan (University of Colorado Medical Center), Dr. Estes has preliminary data indicating that anti-DNA antibodies are more prevalent in proliferative forms of nephritis.

Dr. Israeli A. Jaffe, recently recruited to the Division of Rheumatology, continued his pioneering studies of the role of treatment with penicillamine in rheumatoid arthritis. Dr. Jaffe is coordinator of an international study between the United States and Russia on the clinical efficacy of penicillamine. In addition, in collaboration with Dr. Parvin Merryman, he is studying the effects of penicillamine on lymphocyte function in man.

Honors

Dr. Leonard Chess, who is a member of the American Association of Immunologists and the Merit Review Board in Immunology for the Veterans Administration, was appointed to the Immunobiology Study Section of the NIH. Dr. Chess was also an invited lecturer at a Symposium on Human Antibody Production held at the University of Utrecht in the Netherlands and was a guest speaker at the National American Association of Histocompatibility Testing in Boston. In addition, he was co-chairman of the Immunology Section of the National American Rheumatism Association Meetings in New York.

Dr. Jane Morse was a member of the Allergy and Clinical Immunology Research Committee of the NIAID and a member of the editorial board of *Arthritis and Rheumatism*.

Dr. Dorothy Estes was elected Vice President of the New York Rheumatism Association.

The Mary Imogene Bassett Hospital

Teaching

The teaching program continued to be focused on the twenty residents, of whom six are in each of the first three years, and two in the chief residency year, and on the students from the College of Physicians and Surgeons and other medical schools who rotate through various electives offered by the Department of Medicine. A total of seventy-five months were spent on electives offered by the medical service, including twenty-one months as subinterns, five months in ambulatory medicine and the remainder in subspecialties. Of these, sixty-seven months were spent by students from the College of Physicians and Surgeons.

Clinical Activities

During the past year 2,127 patients were admitted to the medical service, and spent a total of 21,022 days in the hospital for an average length of stay of 9.9 days. There were 29,972 visits to the Outpatient Clinic, not including medical visits to the Emergency Room. The three new physicians appointed in 1978 brought the medical faculty to a total of twenty-four.

Included were full time specialists in endocrinology, pulmonary medicine and cardiology.

Harlem Hospital Center

Teaching

Teaching commitments continued in Introduction to the Patient, the major clinical year Medical Clerkship, and numerous fourth-year electives. Many students from Columbia University as well as many from other medical schools enrolled in electives at Harlem Hospital Center. Teaching was also provided for Physicians' Assistant students and medical students from the City University of New York Biomedical Program. Post-graduate education was provided for 84 house officers and fellows, a group comprised of graduates of 31 United States medical schools.

Clinical Activities

Admissions—5,177; deaths—536; autopsies—140.

Research

Dr. Harold S. Ballard studied platelet dysfunction in myeloproliferative diseases. Dr. George Branche, with Dr. Gerald Thomson, reviewed the impact of nurse therapists on the care of patients with uncomplicated hypertension in the ambulatory setting. Dr. Donald A. Feinfeld, with Dr. Ronald Gade of the Albert Einstein College of Medicine, studied the microradiography of nephrons in renal disease. Techniques developed offer promise of visualization of large numbers of nephrons, permitting new morphologic concepts to be advanced particularly in patients with acute renal failure and obstructive nephropathy. In collaboration with Dr. Gerald Fleischer at the Albert Einstein College of Medicine Dr. Feinfeld investigated the appearance of a renal cytoplasmic protein, ligandin, as a marker for tubular injury. With Dr. Anne Briscoe, Dr. Feinfeld continued his studies of the role of parathormone in the neurological complications of uremia.

Dr. P. C. Taylor Dickinson and Dr. Charles P. Felton, together with Dr. Carol Bosken and Dr. John Edsall, began a prospective study of the characteristics of bacterial pneumonias.

Dr. Charles P. Felton, together with Dr. James Chien and Dr. John Edsall, continued a collaborative United States Public Health Service study of the efficacy of short-course, (six months), chemotherapy of pulmonary tuberculosis. With Dr. Yasoma Challenor of the Department of Rehabilitation Medicine, Dr. Felton studied nerve conduction velocities and quantitative neural function in patients with sarcoidosis.

Dr. John Lindenbaum continued his studies of nutritional anemias. With Drs. David Savage and Richard Sims, folate deficiency in a study of 70 patients was shown not to be an important factor in the susceptibility of alcoholics to infection. With Dr. Eric Hardt, the usefulness of the serum ferritin in the differential diagnosis of anemias was prospectively evaluated. Dr. Lindenbaum surveyed the records of 200 patients with pernicious anemia. Twenty-four patients were found to have had more than one episode of B₁₂ deficiency, a mean of fifty-two months after interruption of maintenance B₁₂ therapy. Of 357 consecutive patients with well documented megaloblastic anemias, 84 were found to lack neutrophil hypersegmentation, probably as a reflection of shortened marrow neutrophil transit time. In collaboration with Dr. Charles Gerson of the Mount Sinai School of Medicine, digoxin absorption was found to be impaired in about half of patients who had undergone jejunoileal bypass for obesity and to be normal in patients with untreated sprue. With Dr. Jay Brown and Dr. Vincent P. Butler, Jr., the conversion of digoxin to a relatively inactive metabolite, dihydrodigoxin, was studied in normal volunteers and patients with cardiac disease.

Dr. Frank Marxer with Dr. Eric Vanderbush, prospectively studied the impact of the telephone on the ambulatory care of patients with ventricular failure. Dr. Clayton Natta, in collaboration with Dr. Arthur Bank, studied factors determining the regulation of hemoglobin synthesis in sickle cell and thalassemia heterozygote patients. Dr. Natta, with Dr. Koji Nadanishi and Valerie Balogh-Nain (Biochemistry), studied the membrane active anti-sickling agents, DBA and Trolox C. Studies of the role of flavones in the varying clinical severity of sickle cell anemia continued with Dr. Myron Brin and Lawrence Machlin of the Department of Biochemical Nutrition, Hoffman-LaRoche Co. In addition, with Dr. Leon Kremzner (Neurology) Dr. Natta investigated relationships between naturally occurring polyamines and sickle cell anemia.

Dr. Jeanne Smith, with Dr. Arthur Bank, Dr. Yusuf Khakoo, Dr. Doris Wethers, and Dr. James Wolf, all from the Department of Pediatrics, participated in a prospective, multi-institutional study of the clinical course of sickle cell disease.

Dr. Eric Vanderbush together with Dr. Philip Peterson of the University of Minnesota, began a long-term prospective study of staphylococcal endocarditis.

Honors

Dr. Harold Ballard was appointed to the Advisory Committee, Division of Blood Diseases and Re-

sources of the National Heart, Lung and Blood Institute and served as Chairman of the Policy Board of the Cooperative Study of the Clinical Course of Sickle Cell Disease.

Dr. Carol Bosken was elected to the Board of Trustees of the New York Lung Association.

Dr. Anne Briscoe served as President of the Association of Women in Science Educational Foundation, as Chairperson of the Organizing Committee for the New York Academy of Sciences, and as Chairwoman of the New York Academy of Sciences' Committee on Women in Science.

Dr. John Edsall served as a member of the American Thoracic Society's Committee on the Treatment of Tuberculosis in Pregnancy.

Dr. Charles P. Felton served as a member of the Tuberculosis Advisory Committee to the Commissioner of Health of the City of New York, as Chairman of the American Thoracic Society's Committee on the Treatment of Tuberculosis in Pregnancy, as a member of the Executive Committee of the Board of Directors of the New York Lung Association.

Dr. John Lindenbaum was Chairman of the Nutritional Anemias Subcommittee of the American Society of Hematology. Dr. Lindenbaum was a member of the National Liaison Committee of the American Society for Clinical Nutrition as well as a Visiting Professor at the University of California at Los Angeles and at the University of Maryland.

Dr. Clayton Natta was a member of the National Institutes of Health Policy Committee on Extracorporeal Methods of Treatment of Sickle Cell Anemia.

Dr. Jeanne Smith served on the National Heart, Lung and Blood Institute's Policy Board on the Evaluation of Potential Therapeutic Agents for Sickle Cell Disease.

Dr. Gerald E. Thomson served as Chairman of the New York Heart Association's Committee on Hypertension, and as a member of the Board of Directors of the New York Heart Association. Dr. Thomson was Chairman of the Statewide Program and Planning Committee on Hypertension of the New York State Department of Health's Bureau of Chronic Disease and was a member of the Advisory Committee on Hypertension to the New York State Department of Health as well as a member of the Health Research Council of the State of New York. He was also a member of the Mayor's Committee on Woodhull Hospital as well as the Advisory Board of the Kidney Foundation of New York and the Planning Committee for the National High Blood Pressure Conference.

Overlook Hospital

Teaching

The major thrust towards the training of a sophisticated primary care internist was continued this year at the Overlook Hospital with the addition of increased sub-specialty office rotations by the resident staff in non-traditional, but vital ambulatory experiences. These rotations included Office Dermatology, Office Medical Orthopedics, Office ENT, and Office Neurology. The members of the Department with special skills in bedside teaching were identified by a committee composed of house staff, senior attendings and full-time faculty. These physicians were placed on a carefully screened Automatic Teaching List. This latter list enabled the house staff and attendings with the greatest teaching ability to interact in a meaningful and positive manner in caring for a medical teaching service with beds numbering approximately 150.

The third and seventh floors of the hospital were officially designated as geographical teaching units. This permitted much greater and more prolonged daily contact between house staff and faculty. Formal conferences in traditional subspecialties were held three times a week with subspecialists presenting in depth formal lectures. The Department of Medicine continued its weekly medical conference with a heavy emphasis placed on the underlying mechanisms of disease states, as well as the pragmatics of diagnosis and therapy.

The Department of Internal Medicine, in conjunction with the Department of Pediatrics, was awarded a highly competitive HEW grant of over one half million dollars for the next two years for the office training of the primary care Internist and Pediatrician. This grant, which was made by the Department of HEW through its health resources administration, Bureau of Health Manpower, was the only one of its kind awarded to a New Jersey hospital. The new training program will emphasize ambulatory care and will be conducted not just in the hospital, but in two Primary Care satellites that will function as Internal Medicine and Pediatric group practices replacing the traditional clinic system and providing one class care for all patients. The mission of this program is to train Pediatricians and Internists who will provide excellent primary care in the context of the family and the community. Overlook's new program will also train physicians to handle the psychosocial factors whose effect upon the patient is significant, often profound, yet largely ignored in physician education. Grant

funds will also help the hospital expand the use of videotape for teaching interpersonal skills so that residents can learn how to recognize and help patients handle emotional as well as physical pain. Experts will review the tape with residents and help them develop their ability to perform more meaningful and comprehensive histories and physicals as well as to deal more effectively with the whole person.

A ten week course in Emergency Medicine was held at the Overlook Hospital during this past year. Formal lectures in all aspects of emergency care were given by subspecialists in their respective fields. The course was highly successful and well attended by house staff and private practitioners.

The Family Practice Residency continued with the support of a manpower training award from the Department of Health, Education and Welfare. The program continued to emphasize areas of preventive medicine, organization of health care and patient compliance. Areas such as home care of the post coronary patient, home care of the terminally ill patient, post surgical rehabilitation, and emotional problems at home were addressed by a full-time coordinator of patient and community health education with the cooperation of resident physicians and volunteer and full-time faculty.

Clinical Activities

The Overlook Hospital Mobile Intensive Care Unit operating as a pilot project under the New Jersey State Department of Health has now completed three years of operation. During this period over 3,000 calls have been made by the unit. Two non-transport vehicles are in operation, one staffed by a driver and two paramedics while the other is staffed by a driver, paramedic and house staff officer on duty in the Emergency Department. Both units have full radio and telemetry capability and all clinical encounters are taped in order to be available for later review. Currently between 1,400 and 1,500 calls are made annually.

Patient Statistics

Admissions—6,161; deaths—388; autopsies—98.

The leading diagnoses in patients admitted to the Medical Service, in order of frequency were: chronic ischemic heart disease, acute myocardial infarction, pneumonia, cardiac failure, acute and chronic cholecystitis, diabetes mellitus, liver disease, malignancies (lung, breast and colon), chronic obstructive pulmonary disease, and hematologic disorders (anemia, lymphoma).

Research

Overlook Hospital continues to participate in a multi-center clinical trial, the Persantine Aspirin Reinfarction Study. During the past year the Beta-Blocker Heart Attack Trial sponsored by the National Heart, Lung and Blood Institute has been initiated at Overlook Hospital. This is a five year multi-center study to evaluate the effectiveness of Propranolol in the secondary prevention of myocardial infarction. Morristown Memorial Hospital and St. Barnabas Hospital are cooperating with Overlook Hospital in the recruitment of patients during hospitalization for acute myocardial infarction.

A double-blind cross over treadmill study to evaluate the effectiveness of Pindolol, a new beta blocking agent in the treatment of angina pectoris continues in the Cardiopulmonary Laboratory. To date, ten of an anticipated twenty patients have been evaluated.

A holter monitor study to evaluate healthy nurses from critical and non-critical care units in the hospital is also underway in the Cardiopulmonary Department.

Honors

Dr. William F. Minogue was re-appointed Medical Director, Emergency Medical Services, New Jersey State Department of Health.

Dr. Michael Bernstein was appointed to the Executive Committee of the American Society of Internal Medicine and was elected Governor-Elect of the American College of Physicians for the State of New Jersey.

Roosevelt Hospital

Dr. Nicholas P. Christy resigned as Director of the Department of Medicine, Roosevelt Hospital on August 31, 1978. In his thirteen years as Director he had brought into the Department essentially all its present full-time complement of six physicians as well as a comparable number of part-time physicians with significant teaching and research activities. During the same period he authored many publications and served in a variety of capacities on various professional organizations and committees for the National Institutes of Health.

Dr. A. Gregory Jameson, Associate Director of the Department for twelve years, was appointed Acting Director.

Teaching

The Medical Service of The Roosevelt Hospital continued to teach two required courses: Introduction to the Patient and the Major Clinical Year Clinical

Clerkship in Medicine. A number of fourth year students also selected various medical electives offered by the staff. The Alcoholism elective accommodated not only medical students but also house officers and physicians in practice. The Gastroenterology Division hosted Inter-Columbia Gastrointestinal Conferences which were well attended and which permitted a great deal of interchange among the affiliated hospitals. The Cardiology Division, in conjunction with the Department of Anesthesiology at Presbyterian Hospital, designed an individual preceptorship program for Resident Anesthesiologists interested in obtaining additional cardiology skills relevant to their specialty. Dr. Marianne Legato, a member of the Cardiology division, embarked on a study of medical students in cooperation with the Association of American Medical Colleges. In addition to fourth year medical students, a Visiting Hematology Fellow from U.C.L.A. and a Pediatric Fellow from Beth Israel Hospital spent time in the Coagulation Laboratory in order to become familiar with coagulation methods and clinical interpretation of such studies. Pharmacy students from St. John's University attended Dermatology and Hypertension-Renal Clinics and rounds. The Primary Care Program continued the teaching of house staff in both the In-Patient setting and in the General Management Units. The Allergy, Clinical Immunology and Infectious Disease Teaching Program consisted of four Fellowship trainees, a rotating medical resident, a pediatric resident and a P&S medical student.

Clinical Activities

During 1978 the Medical Service admitted 4,336 patients. A total of 28,850 visits were made to the general medical and medical specialty clinics, and an additional 22,193 patients were seen in the Substance Abuse Clinic. Visits to the Emergency Department totaled 47,206.

Dr. Thomas Guthrie has instituted elementary training of the house staff in Computerized Tomography. During 1978 the Endocrinology Division initiated a program to screen patients who in the past had received irradiation to the head and neck area. Approximately 250 patients were seen, 15% of whom had palpable abnormalities. The Hematology Division continued to participate actively in Cancer and Leukemia B (CALGB) studies and investigated several new drugs including Cis-Platinum, Chlorozotocin, Hexamethylmelamine, and immunotherapy with MER-BCG. Service consultations made by the Chest group totaled nearly 300. The number of fiberoptic bronchoscopic procedures continued to increase.

Research

Dr. Christy continued as co-principal investigator of the Department's Endocrinology Training Grant (NIH) and continued to supervise general research activities of the Department.

Aside from the usual patient oriented research in the Coagulation Laboratory, studies have been made on the procoagulant properties of ascitic fluid in hepatic cirrhosis. This has been carried out in collaboration with Dr. J. Beall Rodgers of the Department of Surgery. The principal significance of this study may be in the re-infusion of ascitic fluid into the vasculature.

Dr. Gerald B. Phillips carried out studies on patients with obesity and on patients with diabetes in an attempt to determine whether the predisposition of such patients to heart attacks is related to their hormonal status.

The research activities of the Endocrinology Division were pursued in the laboratories of Dr. William Rosner and Dr. Richard Hochberg. Dr. Saeed Khan continued to work with Dr. Rosner and Dr. Gail Wolf, who had joined his laboratories. Their major efforts were concentrated on the binding and disposition of steroid hormones in blood and their entry and disposition within target organs. Substantial progress toward elucidating the amino acid composition of the binding site of transcortin was made. Pure transcortin was crystallized for the first time in preparation for X-ray crystallography which will be done by Dr. William L. Duax (Buffalo, N.Y.). Together with Dr. John Loeb, (Presbyterian Hospital), the effects of stress and partial hepatectomy on the hepatic glucocorticoid receptor in rat liver were studied. In collaboration with Drs. Mortimer Levitz and Joseph Dancis (New York University School of Medicine), studies on the transport of progesterone across the human placenta were initiated. The major efforts in Dr. Hochberg's laboratory focused on the elucidation of the relationship of the biochemistry of estrogens to breast cancer. A recent exciting finding was the discovery of a new chemical class of estrogen derivatives that are biosynthesized by rat breast cancer. A search for these compounds in human cancer has begun. A new estrogenic compound present in extremely high concentrations in the plasma of the infant rat was discovered. The structure of this estrogen is under investigation. The concentration of this estrogen decreases markedly just before puberty at which time carcinogen inducibility of rat breast cancer is at a maximum. Together with Dr. Rosner, ¹²⁵I-estradiol was synthesized and shown to bind to estrogen receptors. This technique has the potential of vastly simplifying assays for estrogen receptor in

human breast cancer. It is also possible that such an agent could be used to detect and possibly treat estrogen receptor positive breast cancers.

Dr. Anthony Pepe, Dr. Edward Dwyer and Dr. Bruce Pinkernell began an investigation into the effectiveness of a new cardio-selective beta blocking agent, Pindolol, in patients with angina pectoris. Dr. Edward Dwyer, Mr. Ronald Connors and the staff of the Biomedical Engineering Department designed a computer program to implement data acquisition and reporting in the Cardiovascular Laboratory. With this program, a full report is prepared within minutes at the conclusion of each catheterization procedure.

Dr. Anthony Pepe and Dr. Edward Dwyer investigated echocardiographic characteristics of patients with bacterial endocarditis, particularly those with tricuspid valve endocarditis. Dr. Henry Greenberg continued his study in the Coronary Care Unit. Computer-assisted gathering of patient data is currently being analyzed to help predict which patients may develop shock or cardiac rupture in their hospital course.

Dr. Marianne J. Legato collaborated with Dr. Norman Alpert of the University of Vermont on the molecular basis of cardiac contraction and with Drs. Brian Hoffman and Michael Rosen at Columbia-Presbyterian Medical Center on the developmental changes in the normally growing mammalian heart. In both projects, the aim is to achieve better understanding of the mechanisms involved in congestive heart failure and myocardial hypertrophy.

Dr. Richard P. Ames, in collaboration with Dr. Peter Hill of the American Health Foundation, continued his investigation of serum lipid alterations noted in the treatment of hypertension. The findings indicate that diuretic drugs cause increases in serum cholesterol or triglyceride or both. The increases in serum cholesterol are not large, but in approximately 50% of patients the effect is sufficient to offset the benefit conferred by lowering blood pressure on the probability of a subsequent myocardial infarction, according to risk tables developed from the Framingham data. This disturbance may explain, in part, the finding in controlled trials that treatment fails to affect the high incidence of myocardial infarction seen in hypertension. Further studies are underway to discover the mechanism and to determine whether other anti-hypertensive agents have similar action. In this respect, Drs. Ames and Hill are completing an investigation of the anti-hypertensive and metabolic effects of triacrynafen, a new diuretic drug which has uricosuric properties.

Together with Drs. Khing Ong and Paul Lang of the Infectious Disease staff, Dr. Michael Grieco

studied T. lymphocyte subpopulations in allergic disease. *In vitro* ragweed antigen E increased the activity of T lymphocytes with receptors for IgM (Tm) in ragweed-sensitive patients while T lymphocytes with receptors for IgG (Tg) responded in ragweed non-sensitive subjects. Tm and Tg lymphocytes may represent the helper and suppressor cells controlling IgE antibody synthesis. This work indicates that IgE antibody production may lead to suppression of the response in allergen-sensitive patients.

Together with Drs. David Meriney and Thomas Nall, studies have continued in stinging insect sensitivity. Using the radioallergosorbent technique, yellow jacket venom was fractionated to determine the constituent antigens. These studies may lead to development of improved diagnostic reagents and immunotherapy.

Drs. Robert W. Jones and LeClair Bissell continued two research projects: 1) a cost-benefit study in conjunction with Blue Cross. The goal of this effort is to demonstrate that admitting alcoholics to the Smithers Rehabilitation Unit, while adding a benefit (and hence an expense) to treatment covered by insurance, will actually result in savings since a significant number of alcoholics will stop drinking and hence stop the repeated "revolving door" type hospital admission practice. 2) Longitudinal studies of alcoholic professional men and women. This patient cohort includes some 450 subjects composed of physicians, nurses, dentists, attorneys, social workers and appropriate controls, all members of Alcoholics Anonymous. This is the first longitudinal study of AA members and first adequate study of professionals.

Dr. Harvey J. Weiss, with Dr. Vincent T. Turitto, demonstrated that prostacyclin (prostaglandin I_2), a substance produced in a vessel wall, inhibited both the adhesion and thrombus formation of platelets on arterial subendothelium. These findings provide evidence that prostacyclin could mediate the deposition of platelets on injured vascular surfaces. This regulation could be important in modulating both hemostasis and the development of atherosclerosis. Dr. H. J. Weiss (with Dr. B. Lages) demonstrated that patients with platelet storage pool deficiency have an impaired capacity for synthesizing prostaglandins in response to agonists such as collagen and thrombin, which liberate arachidonic acid from platelet phospholipids. These patients, however, are capable of synthesizing prostaglandins from exogenously added arachidonic acid. These findings suggest patients with this disorder may have a defect in the phospholipase A_2 mechanism which liberates arachidonic acid from membrane phospholipids. This hypothesis

would explain the platelet release defect found in these patients.

Dr. W. Vicic (with Drs. H.J. Weiss and B.A. Lages) demonstrated that factor V activity can be released from platelets after stimulation with collagen and ADP and showed that this could be inhibited by cyclo-oxygenase inhibitors. Their studies further suggested that platelets factor V was stored in α -granules.

Dr. H.J. Weiss (with Drs. B.A. Lages and W. Vicic) provided evidence that platelet procoagulant activity could exist as an isolated defect, independent of platelet aggregation and release defects, and in collaborative studies with Dr. P. Majerus (Washington University, St. Louis) provided evidence that the platelet factor 3 activity of platelets could be the property by which the platelets bind activated factor Xa to platelet-bound factor V.

Dr. B.A. Lages continued to perform extensive studies on the role of ADP release and metal ions in platelet secretion. Dr. V. T. Turitto provided evidence that the deposition of platelets on vascular surfaces is strongly dependent on the concentration of red blood cells. This finding could have implications for the thrombotic complications that are seen in patients with various types of polycythemia.

Honors

Dr. Nicholas P. Christy continued to serve as Recorder of the American Clinical and Climatological Association, as a member of the Endocrinology Study Section of the NIH, as a member of the Advisory Board of the *American Journal of Medicine* and as a consulting editor for the Beeson-McDermott *Textbook of Medicine*. He also acted as a consultant to WHO. He was elected Secretary-Treasurer of the Endocrine Society (USA).

Dr. William Rosner served on the public affairs and postgraduate committees of the Endocrine Society.

Dr. Richard Hochberg served on the editorial board of *Endocrinology*.

Dr. David Sibulkin became the Vice-Chairman of the Legislation Committee of the New York County Medical Society.

Dr. Wilbur B. Hulbut was appointed Chairman of the Stanford University Medical School Committee on Trusts and Bequests and served on the Medical Malpractice Mediation Panel of the New York State Supreme Court.

Dr. Marianne J. Legato was an Invited Lecturer at the Annual Meeting of the Association of American Medical Colleges, New Orleans, Louisiana, at Downstate Medical Center, Brooklyn, and at the

New York Heart Association in New York City. She was appointed to the Board of Directors New York Heart Association with commission to make a special film presentation for that organization in connection with fund raising plans.

Dr. Annetta Kimball, member of the Gastrointestinal Department has been elected as Vice-President and Program Chairperson, New York Academy of Gastroenterology, and Co-chairperson, Scientific Advisory Committee, New York Chapter of the National Foundation for Ileitis and Colitis.

Dr. LeClair Bissell was appointed to serve on the Advisory Council of NIAAA and was on the Alcoholism Task Force of the President's Mental Health Commission.

Dr. Harvey J. Weiss continued to serve on the Editorial Board of the *American Journal of Medicine* and the Proceedings of the Society for Experimental Biology and Medicine, the Advisory Committee of the Blood Disease Division, National Heart, Lung and Blood Institute of the National Institutes of Health and on the Policy Board of NIH- Aspirin-Myocardial Infarction Study. He was appointed to the Editorial Board of *Blood* and was elected to the International Committee on Thrombosis and Hemostasis.

St. Luke's Hospital

After three and a half years as Director of the Medical Service at St. Luke's Hospital, Dr. William Clark resigned on December 31, 1978. Dr. Stanley Cortell was appointed as Acting Director as of January 1, 1979.

Teaching

The Medical Service continued to participate heavily in the educational program of the College of Physicians and Surgeons. Staff members served as preceptors in both Introduction to the Patient and the Major Clinical Year Clerkship. Many fourth year students took advantage of elective opportunities as subinterns on the Medical Service while others elected subspecialty rotation.

A formal residency training program was approved in September 1978 for the Division of Nuclear Medicine by the American Medical Association Committee on Residency Education.

Dr. Donald Rawlinson, (Neurology and Pathology), instituted monthly conferences on neuropathology.

The Divisions of Metabolism, Nutrition and Endocrinology, provided teaching for graduate students in the Institute of Human Nutrition, including 16 M.S. candidates and 23 Ph.D. candidates.

Clinical Activities

Drs. S. Yablon (Rockland County), H. Jernow (White Plains) and H. Garfinkel (Danbury, Conn.) joined the Division of Nephrology.

Dr. M. J. Frankel joined the Pulmonary Division as Director of the Pulmonary Function Laboratory. Under his direction, a new computerized clinical pulmonary function testing unit was added to the laboratory to provide sophisticated non-invasive evaluation of pulmonary function. Dr. A. Mallios joined the Attending Staff of the Pulmonary Division and Dr. J. Padula, the Research Staff.

The Divisions of Nuclear Medicine and Cardiology collaborated to develop Nuclear Cardiology as a clinical service. Drs. R. N. Pierson and M. Friedman from Nuclear Medicine and Dr. W. A. Tansey, Assistant Director of the Cardiac Care Unit, participated in this cooperative venture.

Dr. E. Enlander, who joined the Division of Nuclear Medicine in 1978, instituted techniques for full scale renal function and imaging measurements.

Special clinical programs for the study and management of lipid transport disorders and for the behavioral and other modalities of treatment of obese patients were emphasized by the Director of Metabolism and Nutrition. A new program for weight reduction was initiated at the St. Luke's Obesity Research Center. Research data on psychological, behavioral and endocrine functions as well as in food intake patterns are being collected on these patients.

Research

Dr. R. B. Case continued his studies of the potential role of CO_2 in controlling autoregulation of coronary flow in experimental animals. A microelectrode, permitting direct measurement of CO_2 within the heart muscle, made possible studies regarding the effect of inadequate coronary flow on CO_2 within the myocardium.

Studies of human coronary blood flow utilizing Xenon 133 and a gamma camera were pursued in collaboration with Nuclear Medicine. Resting coronary blood flow was significant only in regions of the myocardium which failed to contract when compared to normal areas, although there was a tendency to lower resting flows in contractile myocardium beyond severe stenosis. There was a progressive reduction in response to hyperemic intervention (contrast media) which could still be elicited beyond severe stenosis and in akinetic areas of the myocardium.

Dr. W. A. Tansey in association with Drs. M. Friedman and R. Pierson of the Nuclear Medicine Division studied sequential changes in left ventricular contraction patterns as well as right ventricular

performance following transmural myocardial infarction. They also studied sequential changes in the myocardial contractile pattern before and after replacement of severely stenotic aortic valves. They are currently evaluating right ventricular performance in a variety of disease states including inferior wall infarction.

Drs. E. Alam and G. Kemp, Jr. published data on asynchronous left ventricular relaxation. These studies indicated that what has been previously thought to represent early relaxation in fact represents delayed relaxation of large portions of the left ventricle, primarily in ischemic states.

Dr. A. Cameron (in association with Drs. H. Kemp, S. Shimomura, E. Santilli and the cardiac surgeons, Drs. J. E. Hutchinson, III, G. E. Green and H. A. Mekhjian) assembled seven year follow-up data on patients who underwent surgery for coronary heart disease.

Drs. Kemp and Cameron continued to participate in the NIH supported Collaborative Studies in Coronary Artery Surgery.

Dr. P. Holt continued his studies of intestinal lipoprotein production in the rat model. Following the observation that the feeding of sucrose enriched diets stimulated the intestinal production of triglyceride rich lipoproteins, he demonstrated that sucrose but not glucose rich diets stimulated jejunal cholesterol synthesis. Intestinal fatty acid and triglyceride synthesis was not enhanced by sucrose feeding. The data suggests that the intestine is the source of the increase in intestinal lipoprotein cholesterol after sucrose, whereas the increase in lipoprotein triglyceride may be derived from circulation lipids. With Dr. I. Gutwein, Dr. Holt showed that preparation of patients for barium enema with a formula diet results in a 30% improvement in the quality of the radiographs and 50% greater caloric intake. With Dr. Feibush, Dr. Holt perfected a new method for measuring carbohydrate malabsorption using breath hydrogen excretion analysis. All postgastrectomy patients showed malabsorption of dietary carbohydrate and preliminary observations imply that nutritional status correlates with the capacity for carbohydrate absorption. The absorptive capacity for dietary carbohydrates in aged subjects was found to be significantly impaired when compared to younger control subjects.

Mr. S. Itzkowitz (a third year medical student), Drs. S. B. Clark and N. S. Rosensweig demonstrated that ileal glucose perfusion increased proximal jejunal sucrose, maltase and lactase activities, suggesting a hormonal mechanism for this effect. In a collaborative clinical study between the Divisions of Cardiology and Gastroenterology, Drs. Grossman,

Kemp and Rosensweig evaluated 40 patients with angina-like chest pain and normal coronary angiography. They showed that 62.5% had at least one abnormality (by esophageal motility) and that 81% of those that were treated improved.

Dr. J. W. Saleh studied the effect of metoclopramide upon the rate of gastric emptying in diabetic patients with gastric stasis. Dr. R. S. McCray, while coordinating a national study of the incidence of "early gastric cancer" in the United States, found that aggressive diagnostic studies in the past four years have increased the frequency of the diagnosis of this early lesion from 2.5% to 5%.

Drs. T. Boussios and J. F. Bertles, investigating mammalian hemoglobin ontogeny, discovered that hamster yolk-sac erythroid cells contain adult hemoglobins. This finding supports the concept that hematopoietic organs (liver, spleen, marrow) functioning later in ontogeny are colonized by progeny of cells originating in yolk sac tissue, and that the type of hemoglobin made is very likely influenced by the microenvironment within the particular organ.

Dr. Bertles, in collaboration with Dr. A. Kaperonis and Dr. S. Chien (Physiology), found that the influence of organic phosphate on the hydrogen ion concentration inside normal and sickle erythrocytes begins to wane as the cells age in the circulating blood. The impact of the resulting fall in pH in older populations of sickle cells is an unfortunately enhanced tendency to sickle.

Dr. B. Fairchild and Dr. C. Chiu found that the hemoglobin fibers that cause sickle cells to "sickle" demonstrate x-ray diffraction patterns nearly identical to patterns from true crystals of deoxygenated sickle hemoglobin. As intermolecular contact sites in the crystals have been established, these sites can now serve as a basis for attempts to destabilize fibers, i.e., to prevent sickling.

Dr. A. Maniatis, in collaboration with investigators at the University of Washington School of Medicine, examined erythrocytes from individuals with various hematologic disorders by immunologic techniques. When the cell expression of two fetal markers, "i" antigen and fetal hemoglobin, is increased, the markers coexist on individual erythrocytes if the marrow is acutely regenerating, but the marker distribution is random in most other circumstances. Thus the pathologic existence of fetal-type erythrocytes in adult humans is usually produced by several genetic processes.

Dr. W. Poillon, continuing his studies on chemical agents capable of preventing red cell sickling, found that the effects of various salts on solubility of deoxygenated sickle hemoglobin is not dependent on ionic strength but rather on the type of salt used, with

perturbation of hydrophobic forces more important than alterations in electrostatic interactions.

Drs. J. L. Axelrod and R. S. Kochman continued their research on the pharmacology of antibiotic levels in aqueous humor. After studying cephadrine and cefaclor, they began to evaluate cefoxitin. Dr. Axelrod is evaluating a new slide agglutination test for rapid identification of streptococci and gonococci.

Dr. Sami A. Hashim continued to conduct studies of medium chain triglycerides (MCT) in man and experimental animals. Premature infants fed MCT as a major source of dietary calories have improved fat and nitrogen absorption with concurrent improvement in the absorption of calcium and magnesium. Dr. Hashim and Dr. Phienvit Tantibhedhyangkul showed that rats fed MCT from weaning are significantly less obese and have significantly less adipose tissue cellularity, both in cell number and size, than animals fed isocaloric amounts of long chain triglycerides. The mechanism of this effect was related by Drs. Marcelle Lavau and Hashim to drastic diminution of lipogenic enzyme activities in adipose tissue: citrate cleavage and malic enzymes, and two dehydrogenases of glucose. Drs. Lavau and Hashim also showed that MCT-induced hyperketonemia influences brain metabolism through substrate concentration without apparent long-term inductive effects. The metabolic effects of intravenously administered radio-labeled MCT and MCT-derived fatty acids are under investigation by Dr. Hashim and his associates.

Dr. F. Xavier Pi-Sunyer, in collaboration with Ms. Kathleen Vermitsky and with Drs. Colin Weber and Keith Reemtsma of the Department of Surgery, conducted studies of the long-term functional integrity of intraperitoneal islet-transplanted rat pancreatic islets and of tissue culture preservation and intramuscular transplantation of both rat and human islets. Dr. Pi-Sunyer also completed studies of the effect of age and fasting on the response of circulation carbohydrate and lipid metabolites of rats whose adipose tissue has been enriched with odd-carbon fatty acids. With Dr. Harry Kissileff, studies were initiated on the effects of cholecystokinin on food intake regulation in human volunteers.

Dr. Pi-Sunyer with Ms. Susan Fried, is studying the relationship between lipogenesis and glucose utilization in rat adipocytes.

Dr. Robert S. Bernstein studied control of adipose tissue substrate utilization in states of insulin resistance induced by diet and in cultured adipose tissue. He is currently working with a stimulatory effect of human serum on insulin responsiveness of cultured tissue. In collaboration with Melvin Grundleger, he

demonstrated that adipose tissue from diabetic rats, unlike normal adipose tissue, has a significant increase in fatty acid synthesis when incubated with physiological concentrations of leucine.

Dr. Theodore Van Itallie and Dr. Katherine Porikos continued to investigate defense of body weight in human obesity by means of a "platter service method". Hospitalized volunteers are given unrestricted diet and exposed to a variety of challenges to habitual levels of calorie intake, such as caloric dilution of diet or anorectic drugs.

Dr. Van Itallie with Dr. Mei U. Yang is studying in the human the effects of protein-modified fasting vs. isocaloric carbohydrate-protein mixed diet on metabolic balance and composition of weight loss. Dr. Van Itallie, Yang, and Steven Gale studied the food intake behavior of obese mice and their lean siblings. They have also completed a study of dietary obesity vs. genetic obesity on body composition and fat cell morphology.

Dr. Kissileff with Dr. Van Itallie studied the effect of food consistency on eating in human volunteers by use of an eating monitor. They found that individuals eat a liquefied food faster than one in solid form but consume identical caloric quantities of each form. They have also found in man that a quadratic model adequately describes the curve of cumulative intake in single meals of a liquefied food.

Dr. M. Lavau with Ms. S. Fried investigated the relationship between insulin binding and insulin effect of glucose transport and glucose metabolism in adipocytes of fat-fed rats in an effort to unravel mechanisms of insulin resistance of these adipocytes.

Drs. S. Cortell and G.S. Lefavour, in collaboration with Drs. S. Spevack and F.J. Gennari and C.R. Gaffisch from the Department of Medicine at Tufts University School of Medicine, continued their studies of the role of intrarenal physical factors on the control of sodium excretion by the rat kidney. They showed that the rat kidney has to be exposed to the effects of extracellular fluid volume expansion for at least thirty minutes, if it is to have a sustained response. Drs. J.F. Donahue, Gennari (Tufts University), Cortell and Lefavour studied the effects of hyperoncotic albumin infusion on the natriuretic response of the rat kidney. In other studies they showed that it takes more than thirty minutes of volume expansion before alteration of concentration gradients for sodium and urea to occur within the renal medulla. Such changes in the intrarenal milieu may be the mechanism by which the kidney responds to volume expansion. Dr. J. Brensilver studied the anion gap in dogs after metabolic acidosis and al-

kalosis. Dr. J. Lorch established an animal model which can be used to hemoperfuse a rat which has received a toxic substance.

The Neurology Division continued its collaboration with Dr. G. Hashim in an ongoing study of immunologic disorders in multiple sclerosis.

Drs. R.N. Pierson, M. Friedman, and W.A. Tansey continued their research in quantitative radiocardiography with emphasis on careful validation by angiography and other traditional methods of the entities of fraction, regional wall motion, and quantitative analysis of right and left ventricular function.

Body composition studies of marathon runners were undertaken in the attempt to find a "super-normal" population. Other studies showed that the integrity of the cell membrane, as marked by its ability to maintain normal intracellular concentrations of potassium and sodium, is not maintained in patients with certain disease states including manic depressive psychosis, and alcoholism. The hypothesis that alcohol susceptibility may be genetically transmitted is being addressed with the cooperation of Dr. R. Stuckey, Medical Director of the Alcoholism Therapy Unit in Summit, New Jersey, who has provided extensive referral of patients, many of whom have brought in both normal and abnormal members of their families for study.

Parallel tissue analysis studies in a rat model for alcoholism have been carried out by the Unit in conjunction with Drs. S. Cohn and S. Yashimura of the Brookhaven National Laboratory.

Utilizing the animal model for acute alveolar injury developed in this laboratory, Drs. S.F. Ryan (Pathology), C.R. Barrett, Jr. and A.L.L. Bell, Jr., published studies on volume-pressure and morphometric observations, and on the physiologic and electron microscopic correlations during the acute and recovery phases. The decreased lung compliance resulting from alveolar epithelial necrosis in early lung injury was due to increased surface tension in alveoli, whereas altered tissue forces due to irreversible alveolar closure become prominent later on. Analysis of lung-lipid content and lung water suggested acute phase loss of surfactant as the mechanism permitting alveolar collapse and interstitial fluid accumulation. Early studies with positive expiratory pressure indicate a decrease in lung compliance which suggests that recruitment of closed alveoli during acute injury may not occur.

Dr. Barrett extended the study of both the diagnostic and therapeutic applications of flexible fiberoptic bronchoscopy during the management of the critically ill.

Honors

Dr. Airlie Cameron was Consultant to the National Institutes of Health Hyperlipidemia Type II study.

Dr. Suzanne Bennett-Clark was a member, General Medicine A Study Section, National Institutes of Health.

Dr. Peter R. Holt served as Chairman, Intersociety Committee on Clinical Experimentation in Digestive Disease on the Editorial Board, *American Journal of Digestive Diseases*, and as Chairman, Scientific Advisory Committee, New York Chapter, National Foundation for Ileitis and Colitis. He was also a member, Work Group on Clinical Research, National Commission of Digestive Disease, and as a member of the Governing Board, American College of Physicians, New York.

Dr. Harvey G. Kemp, Jr., who was a NIH supported delegate to the Zurich meeting on percutaneous transluminal coronary angioplasty held by Dr. Andreas Gruntzig and continued as a consultant to the National Institutes of Health Hyperlipidemia Type II study.

Dr. A. L. Loomis Bell, Jr. lectured at the Annual Course on Pulmonary Physiology, New York Trudeau Society. He also served as Editorial Consultant to *Chest*, American College of Chest Physicians.

Dr. C. Redington Barrett, Jr. was an Invited Panelist, World Congress on Bronchoscopy, Tokyo, Japan, and served as Course Director, Annual Course on Pulmonary Physiology, New York Trudeau Society.

Dr. John F. Bertles was Visiting Professor of Medicine at the Radcliffe Infirmary, University of Oxford for six months. Dr. Bertles also served on the *ad hoc* Hematology Study Section at the National Institutes of Health, and on the Basic Science Review Committee of the National Foundation.

Dr. Richard N. Pierson, Jr. lectured in Tokyo to the Japanese Society for Nuclear Medicine and to the Tokyo Municipal Geriatric Hospital staff. He also participated in the Second Post Congress Symposium in Nuclear Medicine in Taipei, Republic of China.

Dr. Pierson served on the Publications Committee for the Society of Nuclear Medicine, and on several committees of the New York area Society of Nuclear Medicine Chapter. He is President of the New York County Medical Society during 1978-1979.

Dr. Norton S. Rosenweig was elected President, New York Gastroenterological Association. He served on the Editorial Board of the *American Journal of Clinical Nutrition* and as Gastroenterology Section Editor, *American Journal of Medical Sciences*.

Dr. Richard S. McCray was a member of Governing Board of the New York Society of Gastrointestinal Endoscopy.

Dr. Theodore B. Van Itallie continued as Chairman of the Working Group on Clinical Nutrition of the National Commission on Digestive Diseases. He was designated as Editor-in-chief of the *American Journal of Clinical Nutrition*. Dr. Van Itallie was made a member of National Arthritis, Metabolism and Digestive Diseases Advisory Council. Dr. Van Itallie was Chairman of the Steering Committee for the Consensus Conference on Surgical Treatment of Morbid Obesity organized by the National Institutes of Health, and also Chairman of the Steering Committee of the American Society for Clinical Nutrition Workshop on Dietary Issues. Dr. Van Itallie continued as Chairman of the Committee on Medical Sciences of the Board of Trustees of the American University of Beirut and was appointed to the Scientific Advisory Board of the Institute for Behavioral Education.

Dr. Sami A. Hashim chaired a meeting on the "Role of the New Dietitian" in New Orleans at the Annual Meeting of the American Dietetic Association. Dr. F. Xavier Pi-Sunyer was made Chairman, Committee on Diet, of the New York Heart Association. Dr. Robert S. Bernstein was made Chairman of the Research Committee of the New York Diabetes Association. Dr. Harry Kissileff was made Chairman of the Program Committee of the Eastern Psychological Association.

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Microbiology

HAROLD S. GINSBERG

Professor and Chairman of the Department

The Department has continued to strengthen its development as a center for education and research in immunology, virology, and regulation of prokaryotic and eukaryotic cells. The Department of Microbiology is an integral unit of the Cancer Center.

Teaching

Two major courses were presented to medical, dental, and graduate students: 1) Microbiology of Bacterial and Mammalian Cells for first year students; and 2) Biology of Pathogenic Organisms, which includes bacteria, viruses, and fungi, is given to the second year class. For entering graduate students the courses described above are supplemented with a special course in research methods and analysis of experimental data; thereafter graduate students have available graduate courses in Bacterial and Molecular Genetics, Immunochemistry and Cellular Immunology, Prokaryotic and Eukaryotic Cell Physiology, and Virology. During the past year the curriculum of the first two years of medical school has been restructured, and the Department will once more have the opportunity to integrate the teaching of Microbiology for medical and dental students into a single course. The new course will be presented for the first time in the 1979 Spring semester.

Nine new graduate students were accepted into the Department in the Fall of 1978, making a total of 22 enrolled in the Graduate School of Arts and Sciences as candidates for the Ph.D. degree in Microbiology. In addition, one student is registered in another University, but is pursuing her thesis research in virology in this Department.

Five postdoctoral fellows are in training. Six Ph.D. degrees in Microbiology, were awarded and each has obtained an outstanding postdoctoral position: Cecilia Cheng, Sloan Kettering Cancer Institute; N. Yutaka, National Institutes of Health; Mercio Pereira, New York University School of Medicine; Michael Wigler, Cold Spring Harbor Laboratory; Gloria Lee, University of Chicago Virology Committee; and Zvi Kahana, Weizmann Institute of Science, Department of Plant Genetics.

The graduate program is being supported by a training grant recently awarded to us by the National Institute of Allergy and Infectious Diseases.

Under the supervision of Dr. Paul D. Ellner, Drs. Kathleen Bourne and Yvonne Lue completed their second year of training in the Postdoctoral Program in Clinical Microbiology. Dr. Kathleen Bourne has accepted a position with the Department of Pathology and Laboratory Medicine at the University of Texas Medical School. Dr. Yvonne Lue has accepted a position as a research scientist at the New York City Bureau of Laboratories. Dr. Stephen Antopol has an appointment as a visiting fellow for one year in the Department of Pathology.

Research

Dr. Ginsberg, in collaboration with Dr. Karoline Dorsch-Häsler, Dr. Judyta Praskier, Ms. Cecilia C-S Cheng, Ms. Elizabeth A. Oosterom-Dragon, Mr. Ted E. Shutzbank, and Ms. Ulla Lundholm is investigating the reactions regulating the replication of adenovirus and viral transformation of mammalian cells. The studies are pursued using genetic and

biochemical approaches. Dr. Ginsberg and Dr. Dorsch-Häslar have examined the extent and pattern of integration of adenovirus DNA after transformation with wild type (Wt) 5 virus and several ts mutants. Particular emphasis was placed on experiments with H5ts125, which transforms at a higher frequency and integrates all or most of the viral genome, in contrast to Wt virus or other ts mutants. They obtained convincing evidence that the viral DNA was indeed integrated into the host chromosome and did not exist as an episome, that in each transformed cell line the site of viral DNA integration was different (i.e., there is not a unique site for integration in the host chromosome), and that there was only one site of integration in each transformed cell regardless of the number of viral genomes integrated. In collaboration with Drs. Paul Fisher and Bernard Weinstein (Institute for Cancer Research) they demonstrated that several chemical carcinogens increased the transformation frequency of H5ts125 by 2 to 4 fold. However, the chemical carcinogens neither increased the extent of the viral DNA integrated nor altered the pattern of integration. Mr. Schutzbank and Dr. Ginsberg are studying the regulation of transcription of viral DNA in transformed cells in which the entire viral genome is integrated. They found that only viral mRNAs derived from the early regions of the viral genome are found in the cytoplasm; that transcripts derived from those regions of the genome in which the late structural proteins are encoded are also present in nucleus; and that the "early" but not the "late" nuclear transcripts are polyadenylated. With Ms. Cheng they used a ts adenovirus mutant defective in the fiber gene to investigate the structure of the fiber protein and identify reactions in virion assembly. They identified precursor capsid structures into which the viral DNA was shown to enter in a specific orientation: the so-called molecular left end of the viral DNA initiated entry into the partially assembled capsid; after the entire DNA molecule was inside the procapsid, several proteins were processed to stabilize the capsid and complete the virion assembly. With Ms. Dragon the non-structural "100K" protein was purified and shown to be essential for maturation of hexons, the major capsid protein. They immunized rabbits with the purified protein and used the specific antibodies to demonstrate that 100K protein is predominantly present in the cytoplasm of infected cells. The molecular function of this major viral, non-structural protein is being studied. Dr. Praszker isolated more than 40 ts mutants of type 7 adenovirus in order to expand the number of genes that can be functionally studied using conditionally lethal mutants. The mutants have been classified into 8 non-overlapping complementation groups and represen-

tatives of each group are being genetically and biochemically characterized. In collaboration with Ms. Lundholm, Dr. Ginsberg has purified the viral single-strand specific, DNA-binding protein and developed a sensitive radioimmune assay which permits quantitative studies of the synthesis of the binding protein in transformed cells as well as in cells infected with ts mutants. With Mr. Simon Chen and Dr. G. Zubay (Biology) Dr. Ginsberg has studied replication of adenovirus DNA in nuclei isolated from infected cells. In nuclei from cells infected with H5ts125 it was possible to induce DNA synthesis by lowering the temperature after synthesis had been halted at the non-permissive temperature and preliminary data suggest that new rounds of synthesis were initiated in the infected nuclei.

Dr. Ellner and his collaborators have pursued the following projects: Determination of ultraviolet sensitivity of *Legionella pneumophila*; Determination of antigenic relationships of different strains of *Legionella pneumophila*; Evaluation of an automated microbial detection/identification system; Evaluation of a prediluted device for rapid MIC identification.

Dr. Bernard F. Erlanger, with Norbert H. Wassermann and Anne G. Cooper, have continued their experiments on photochromic allosteric effectors of chymotrypsin and are now doing structural studies on the binding site of these effectors. In collaboration with Dr. Roger Lundblad of the University of North Carolina, sequencing studies are being carried out in order to determine where the allosteric site is on the chymotrypsin molecule. Mr. Wassermann and Dr. Erlanger have also continued to synthesize photochromic agonists and antagonists of the acetylcholine receptor. As a result of the preparation and assay of a number of related bis quaternary compounds, they have succeeded in mapping the topography of the combining site of the acetylcholine receptor. Additional collaborative studies with these compounds are being carried out with Dr. Eva Bartels of the Universidad del Valle in Colombia and Dr. Henry Lester of the California Institute of Technology and Drs. George Hess and Aaron Lewis of Cornell University.

Studies on nucleic acid-reactive antibodies are continuing with a number of Dr. Erlanger's graduate students. These antibodies are being used in studies on the architecture of metaphase chromosomes, in collaboration with Dr. Orlando J. Miller (Human Genetics and Development and Obstetrics and Gynecology). Dr. Zvi Kahana, formerly a graduate student in the department, has prepared and characterized antibodies specific for poly A and has determined that they react with single and with double stranded DNA, and has characterized them with re-

spect to their specificities for oligo-A. He has also completed studies on the immunological determination of the distribution of methylated bases in mouse DNA and, in collaboration with Dr. J. Maio, has studied their location in metaphase chromosomes of the African green monkey. He has also completed a study of the distribution of 5-methylcytosine in mouse myeloma DNA and has shown that it is distributed in an uneven, non-random manner in main band DNA and in a more random fashion in satellite DNA. In the latter, 5-MeC is found next to stretches of T residues. In main band DNA, it is not near stretches of T residues. Mr. Jan B. Wollack has prepared several synthetic oligonucleotides and has used them as immunogens. Among the synthetic nucleotides are AAU, AAUU, AAUUU and AAUUUU. He has succeeded in eliciting specific antibodies to each of these sequences and is studying the respective cross reactions in order to determine whether secondary structure plays a part in binding specificity. Mr. Roy D. Meredith has prepared highly specific antibodies to 7-methylguanosine and is preparing to study their activities in naturally-occurring systems. He has shown that these antibodies will react with a variety of "cap" sequences of messenger RNA. He has found no reaction with undenatured ASV-RNA but, in collaboration with Ms. Harriet Castleman, has shown by immunoelectron microscopy that his antibody reacts with the "cap" of ASV-RNA after denaturation in formamide. Mr. Meredith has also continued his studies on restricted antibodies obtained from sheep immunized with (AMP)₂-gramicidin S. In these studies, he is now being assisted by two visiting scientists, Lin-Hsian Wei and Chia-Ling Huang from Shanghai. These scientists are being trained in the immunochemical techniques developed in our laboratory and will soon begin to study the structure of chromatin. Harriet Castleman has continued her extensive immunoelectron microscopic studies on nucleic acid preparations for the purpose of identifying specific bases and base sequences and in examining the secondary structure of these nucleic acids. Dr. William L. Cleveland has developed a procedure for the visualization of single antibody-producing cells. He has begun investigation into the cellular mechanisms of antibody production. He is also planning to use this procedure to study the production of lymphokines and to examine some aspects of antibody secretion. In collaboration with Dr. Sherie Morrison, he is also developing procedures for the elicitation of anti-idiotypic antibodies directed toward the combining sites of mouse myeloma proteins.

The immunochemical laboratories of Dr. Elvin A. Kabat are under the Departments of Microbiology,

Human Genetics and Development, and Neurology. Research has been in three major areas: The structural and genetic basis of antibody complementarity; purification, characterization, and elucidation of specificities and dimensions of the combining sites of various lectins; and structural investigations on the water soluble blood group A, B, H, Le^a, Le^b, I and i glycoproteins.

Dr. Kabat, Professor Tai Te Wu of Northwestern University and Dr. Howard Bilofsky of Bolk, Beranek and Newman are preparing from their data bank a new book giving all sequences of immunoglobulin light and heavy chains. The older volume "Variable Regions of Immunoglobulin Chains" is being expanded to include precursor sequences, constant regions and the J chain of IgA and IgM. Nucleotide sequences from clones will be translated into amino acid sequences and included. The data are accumulated in the PROPHET computer system sponsored and maintained by the Division of Research Resources of the National Institutes of Health, the National Cancer Institute, National Institute of Metabolic and Digestive Diseases, and the National Institute of General Medical Sciences. Immunoglobulin chains comprise about thirty percent of the over 100,000 amino acid residues reported in the literature.

From the sequence data variable regions of the light and heavy chains may be divided into four framework (FR) segments separated by three complementarity-determining regions or segments (CDR). When the available FR sequences were grouped in sets, members of each set having the identical sequence and the individual chains were traced from one set to another, it was found that members of one FR1 set could be associated with different sets in FR2, FR3 and FR4. This assortment was interpreted to indicate that the genetic units were the nucleotides coding for each FR segment; these minigenes, were separated in the genome, perhaps by intervening sequences, which together with the nucleotides for the various CDR were assembled somatically during differentiation and embryonic development to give the nucleotide chains coding for the entire V-region. The findings of Tonegawa and coworkers at the Basel Institute for Immunology that the nucleotides coding for the first three FR and the three CDR were assembled in 12 day old mouse embryo DNA and that between the twelfth day of embryonic life and the adult DNA, the nucleotides coding for FR4, termed the J segment, were added establishes somatic assembly as correct for FR4. Drs. Kabat, Wu, and Bilofsky hypothesized that sperm DNA should be examined and might contain all of the minigenes separated and represent genome

DNA. The data bank is being used in collaboration with Professor Jack L. Strominger and his laboratory at Harvard University and with Dr. Harry Saroff of the National Institutes of Health to determine the extent of homology of the various immunoglobulins with the HLA antigens which determine whether tissue and organ transplants will be accepted.

A considerable number of lectins are being studied to determine the dimensions of their combining sites. Dr. Albert M. Wu, Staff Associate, and Dr. Kabat are collaborating with Professor Ronald Poretz of Rutgers University in studies on the lectin of *Saphora japonica* seeds; it requires metals for activity and shows specificity related to blood groups B and I. Dr. Miercio Pereira, has completed his Ph.D. dissertation entitled "Immunochemical Studies on Lectins and Their Application to the Fractionation of Blood Group Substances and Cells" which included the elucidation of the structure of lectin II of *Ulex europaeus*. This lectin reacts best with certain fucose-containing blood group oligosaccharides and with $\beta 1 \rightarrow 4$ linked oligomers of N-acetyl-D-glucosamine. Molecular models of the various active compounds revealed a structure common to both types of compounds which could account for these findings. Dr. Pereira will return to the Department of Microbiology of the University of Rio de Janeiro. Charles Wood, a graduate student, and Dr. Kabat have been continuing studies with Dr. Irwin J. Goldstein of the University of Michigan in studying the specificity of two of the five isolectins, A_4 and B_4 of *Bandeiraea simplicifolia*; the B_4 site is specific for terminal non-reducing α -linked galactose and the A_4 site reacts best with terminal non-reducing N-acetyl-D-galactosamine but also accommodates terminal non-reducing -D-galactose and is less specific than B_4 . Dr. Manju Sarkar, a Staff Associate, has purified and characterized the combining site of the lectin of *Maclura aurantiaca*. Drs. Sarkar and Kabat have also prepared the methyl α - and β -pyranosides and furanosides of N-acetyl-D-galactosamine which are extremely useful in characterizing lectin sites by inhibition of precipitation or by competitive binding assays; three of the compounds were obtained in crystalline form. In collaboration with Dr. Gilbert Ashwell of the National Institutes of Health, Dr. Sarkar and Dr. Kabat have also characterized the hepatic binding lectin which removes asialoglycoproteins from the circulation; it has a small combining site reacting best with disaccharides with terminal N-acetyl-D-galactosamine. Dr. Hagen Bretting of the University of Hamburg returned to the laboratory for six months to study a lectin from a sponge *Geodia cydonium* and is also characterizing galactans from various snails and Dr. Shunji Sugii,

Staff Associate, is studying the lectins of *Wistaria floribunda*.

Drs. Albert M. Wu, Miercio Pereira, Flavio Gruezo, and Mr. Jerry Liao are isolating by alkaline borotritide degradation oligosaccharides from the interior of blood group substances after removal of the external residues by periodate oxidation and Smith degradation; a large number of tritium labeled reduced oligosaccharides have been purified. From their structures it should be possible to formulate more detailed composite structures for the blood group substances.

Jacqueline Sharon, graduate student, with Dr. Kabat and Dr. Sherie Morrison are trying to make hybridomas by fusing myeloma cells with spleen cells of mice immunized with dextran B512 with 96 percent of $\alpha 1 \rightarrow 6$ linkages to obtain hybrid clones which produce antidextran of $\alpha 1 \rightarrow 6$ specificity. From an analysis of representative clones, the repertoire of antidextran producing cells can be characterized, estimating the relative sizes, shapes, and association constants of the combining sites.

Dr. Kazusuke Takeo of the University of Ube, Japan spent a little over two months in the laboratory under the U.S.-Japan Binational Program. He introduced a method for determining association constants of proteins which bind uncharged macromolecules. This was applied to the interaction of myeloma antidextran with dextran and led to a method which should prove extremely valuable in characterizing the antidextran produced by hybridomas. In principle, if a small quantity of ascitic fluid containing the myeloma antidextran is run in acrylamide gel electrophoresis, many bands are seen. If a similar quantity of ascitic fluid is electrophoresed in acrylamide containing dextran all bands remain in the same position except for the myeloma antidextran which are retarded by being bound to the dextran. If varying concentrations of dextran are used, a binding constant can be calculated. If in addition to adding dextran to the gel, a low molecular oligosaccharide of the appropriate structure is added, it competes with the dextran and the mobility of the myeloma antidextran is restored. Using increasing concentrations of each oligosaccharide, one may compute the binding constant of the myeloma antidextran for the oligosaccharide. The values are in very good agreement with those previously obtained in the laboratory by equilibrium dialysis and fluorescence quenching. Dr. Shunji Sugii and Dr. Kabat are continuing these studies with antifructosan and other antidextran myelomas. The technique will also be applied to determining binding constants of lectins.

The Cellular Immunology laboratories of Dr. Benvenuto Pernis are under the Departments of Mi-

crobiology and Medicine. These laboratories have reached their full potential in the course of 1978. The present staff includes, in addition to Dr. Pernis, one Senior Staff Associate, Dr. Sergio Biguzzi, and two Staff Associates, Lotte Kuhn and Paolo Tonda. There are also two post-doctoral fellows, Drs. Vincent Bonagura and Patricia Love. There are three graduate students, Carol Victor, Phil Roth and Margaret Widman. The staff is completed by one technician, Nicodemo Agostino, and one secretary, Frances Rudner.

In the course of 1978, research lines initiated in 1977 have been developed and expanded and new lines of research have been added.

I. Stimulation of B Lymphocytes with Polyclonal B Cell Activators

A study has been made of the suppressive effect of anti-immunoglobulin antibodies on the maturation of mouse B lymphocytes with the polyclonal activator lipopolysaccharide (LPS). The effect of antibodies directed against different mouse immunoglobulin classes was studied with regard to the specific effect on the appearance of plasma cells containing one or another of the said immunoglobulin classes. Furthermore, the effect of antigen was studied since it was reasoned that antigen might have an effect similar to that of anti-immunoglobulin antibodies by crosslinking the immunoglobulin receptors of specific lymphocytes. The results were that anti-immunoglobulin antibodies completely blocked the appearance of the corresponding plasma cells, but antigen (TNP-KLH) in a variety of concentrations added to the cultures did not affect at all the appearance of cells producing antibodies against TNP. The reasons for the difference in effects between anti-immunoglobulin on one side and antigen on the other are presently being studied.

In the course of the studies of the effect of polyclonal B cell activators, it became apparent that these activators are not totally unselective with regard to the specificity of induced immunoglobulin production. For instance, some idiotypes of mouse immunoglobulins appear to be favored while others disappear in the final population of LPS induced plasma cells. The common idiootype of the $\alpha 1 \rightarrow 3$ glucosyl binding mouse myeloma proteins (MOPC 104 and J 558) is increased by about ten-fold in frequency in the final population of LPS induced plasma cells in comparison to the starting population of unstimulated spleen lymphocytes; on the other hand, the idiootype of a TNP binding myeloma protein MOPC 460, which is present in about 0.2% of unstimulated spleen lymphocytes, is not found at all in the final LPS induced plasma cell population. These

observations open the way to the use of polyclonal B cell activation as a tool to investigate idiootype regulation *in vitro* which is what we are doing at the present time.

This work was performed by Dr. S. Webb and B. Branscomb until August, 1978 and is now being conducted by P. Tonda and N. Agostino.

II. Polyclonal T Dependent Stimulation

Negative results in this field have been obtained with the original plan of exposing to rabbit anti-mouse immunoglobulins spleen lymphocyte populations from mice primed to rabbit gammaglobulins. We are now trying a different approach, namely, that of coupling mouse anti-immunoglobulin antibodies with a T dependent carrier (KLH) and treating with the conjugate normal mouse B lymphocytes cultivated together with purified T cells from KLH primed syngeneic mice. In these cultures we are looking for a polyclonal B cell activation in counting the total number of plaques that one can detect at the end of the culture period with Staph A protein coated erythrocytes. This method (Gronowicz et al., Eur. J. Immunol. 6:588, 1976) detects all immunoglobulin secreting cells in a given lymphocyte population. We are also attempting a more limited stimulation by exposing the same cell population to KLH coupled with monoclonal anti-idiootype antibodies (hybridoma antibodies directed against the idiootype of the TNP binding mouse myeloma MOPC 460) looking for the induction of idiootype positive anti-TNP plaques.

This work is being performed by Lotte Kuhn and Carol Victor.

III. The role of IgD in Antibody Responses *in vitro* and *in vivo*

This line of research is now being pursued with mouse lymphocytes through the use of monoclonal anti-mouse IgD allotype antibodies.

The hybridoma 10-4.22 and the hybridoma 11-6.3, originally developed in the laboratory of Dr. L. Herzenberg, have been obtained from the laboratory of Dr. W. Paul of N.I.H. The first hybridoma reacts with specificity 4 which is carried by the delta chain corresponding to the Ig-5a allele (for instance, in Balb/c mice); the specificity 2 is recognized by the hybridoma 11-6.3 and is carried by the delta chain of the Ig-5b allele (C57 black or B10 mice).

The two above-mentioned hybridomas are grown very well *in vitro* with the use of the Iskove medium; the 11-3.3 hybridoma is also grown as ascites in Balb/c mice. These two reagents, together with the H6/31 hybridoma recognizing specificity 3 of the Ig-5b allele (which is commercially available), provide absolutely specific anti-mouse delta antibodies

that we are now using to probe the function of the IgD receptors in immune responses both *in vitro* and *in vivo*. A particularly promising approach is that of coupling the anti-delta antibodies with a T dependent carrier (KLH or BSA) is conjugated with a monoclonal anti-delta. The use of these conjugates appears suitable to focus T lymphocyte help on B lymphocytes that carry IgD receptors both *in vitro* and *in vivo*.

An extensive plan concerning the study of the role of IgD receptors with the use of the monoclonal anti-delta antibodies is now being carried out in collaboration with Dr. G. Thorbecke of New York University and Dr. G. Siskind of Cornell University. The work in our laboratory is being carried out by P. Tonda and L. Kuhn.

IV. Human Lymphoblastoid Lines

Several human lymphoblastoid lines established *in vitro* have been screened for their ability to synthesize immunoglobulins as membrane molecules as well as secreted. The aim of this study was to identify the conditions that regulate the relative expression of membrane IgM and IgD and the maturation of lymphoid cells from a stage that expresses only membrane immunoglobulins to that of immunoglobulin secreting cells. For this purpose, different lines were cloned by a combination of limiting dilutions and colony formation in soft agar; the clones were compared amongst themselves and to the parental lines. For what concerns the membrane IgM to IgD ration, all the clones that expressed both classes of receptors were found to be quite heterogenous with regard to the ratio of the two classes of single cells. The latter parameter was measured by membrane immunofluorescence staining with two different anti-sera conjugated with different fluorochromes and quantitative microfluorimetry with a Leitz MPV instrument. The frequency distribution of mu/delta ratios of single cells gives a wide unimodal curve if the frequency is plotted against the logarithm of the ratio. The fact that none of the clones shows a uniform ratio suggests the possibility that single human lymphoblastoid cells grown *in vitro* which express mu and delta may express different amounts of these two classes during their life cycle; experiments with synchronized cell populations are in progress to investigate the possible correlation with the mitotic cycle.

Having selected clones that express membrane immunoglobulins but show no sign of spontaneous immunoglobulin secretion, attempts were made to induce maturation to immunoglobulin secretion with different small molecules that have been shown to be active in inducing maturation in *in vitro* of erythroleukemia cells. The molecules tested were

hexamethylenbisdiacetamide and very small concentrations of actinomycin D. It has been found that very small amounts of Actinomycin D (around a few nanograms/ml) induce maturation in a proportion of up to 10% of cells of some clones even when there is no effect on cell proliferation; this maturation has been assessed by the detection of intracytoplasmic immunoglobulin with immunofluorescence and by detection of immunoglobulin secretion by single cells with the protein A hemolytic plaque technique. It has also been established that the same treatment that induces this maturation process induces a rather rapid increase of the mu/delta ration on the membrane of single cells. This line of research promises to give interesting information on the relationship between immunoglobulin expression and maturation of B immunocytes.

This work is being conducted by Philip Roth in cooperation with the laboratories of Dr. A. Bloom and Dr. Paul Marks.

V. The Human Rheumatoid Idiotyp

It has been shown by Kunkel and colleagues that more than one-half of the human monoclonal IgM plasma cell dyscrasias in which the IgM has the property of a rheumatoid factor have a common idiotyp due to extensive similarities in the structure of the kappa light chain of the IgM immunoglobulin. The monoclonal IgM plasma cell dyscrasias with rheumatoid factor properties are about 20% of all cases of macroglobulinaemia; thus, it follows that more than 10% of all macroglobulinaemia patients show this idiotyp. It becomes therefore important to study the frequency of normal human peripheral blood lymphocytes that show this idiotyp in their membrane as a first step in the study of the physiology and the pathology of this prominent specificity of human IgM immunoglobulins.

We have prepared an anti-idiotypic antiserum specific for this rheumatoid idiotyp and the cellular studies are underway. It is interesting to note in the meantime that a hen antiserum prepared against the IgG binding protein A of staphylococcus Aureus crossreacts with the human rheumatoid macroglobulins indicating possible similarities of structure between these two IgG binding molecules of widely different origin.

This work is being conducted by Drs. Sergio Biguzzi, Vincent Bonagura and Patricia Love in cooperation with Dr. H. Kunkel of Rockefeller University.

VI. Human Myeloma

The peripheral blood lymphocytes of eight untreated patients with multiple myeloma have been

studied. In three of these patients, the presence of the myeloma protein on the membrane of T lymphocytes has been identified by a combination of immunofluorescence and a sheep erythrocyte resetting. The T lymphocytes have clearly picked up passively the myeloma protein from the serum since incubation *in vitro* overnight eliminates the finding; on the other hand, if the now clean T lymphocytes are exposed to the original serum, they pick up the immunoglobulin again. The specificity of this immunoglobulin binding by T lymphocytes in patients is now being investigated with a view to the possibility that it may be an idiotype dependent phenomenon. The extension of these studies to mouse myelomas should permit complete identification of possible idiotype specific T lymphocytes (idiotype helpers? Idiotype suppressors?) in monoclonal tumors of B immunocytes.

This work is being conducted by Paolo Tonda in cooperation with Drs. J. Halper and E. Osserman.

Dr. W. Manski, in studies performed in cooperation with Dr. K. Malinowski, the relationship between the distribution and immunogenicity of antigenic determinants of calf lens alpha crystallins and the subunit structure of this protein was investigated. It was found that 45.9% of all reactive antigenic determinants in the native alpha crystallin molecule were located on SH-containing subunits. Of these, the majority (35.3%) were reaggregation dependent, and 10.6% were reactive on monomeric subunits. By contrast, only 10.9% of all antigenic determinants were located on SH-free subunits, and the ratio of aggregation-dependant determinants (4.4%) to those of monomeric subunits (6.5%) was reversed compared to SH-containing subunits. Among all antigenic determinants reactive in native alpha crystallin, 44.1% were dependent on the presence of both types of subunits. These data indicate that the antigenic determinants requiring subunit interaction were formed from SH-containing and SH-free subunits in a ratio of 1:1. Direct analysis showed that in the alpha crystallin molecule, the ratio of these subunits is 2:1. The experiments also show that some conformations of subunits in the native molecule persist in separated subunits. The relative immunogenicity of each type of antigenic determinant expressed as the ratio of the percentage of the determinant reactive in the native calf lens alpha crystallin to the percentage of corresponding antibodies induced by native alpha crystallin was found to be close to 1.

Antibodies to antigenic determinants which are dependent on the quaternary structure of alpha crystallin were used to study the extent of restitution of the native molecule by reaggregation of the interacting subunits in different proportions. Alpha crystallin subunits in 7.6 M urea were separated on a mercury

column into SH-containing (66%) and SH-free (34%) subunits. The subunits were ^{125}I labeled, again dissociated in urea and used in two parallel experiments. In each different proportion the two types of subunits in urea were mixed with only one type of subunit labeled. After dilution, the urea was removed from the mixture by filtration on an Amicon U-2 filter. The reaggregated material was put on an immunoadsorbent with antibodies to quaternary antigenic determinants of alpha crystallin as ligand. The radioactivity bound was used as a measure of reconstitution of native alpha crystallin. Significantly, only when the SH-containing subunits were in excess was native alpha crystallin formed. In excess of SH-free subunits no native alpha crystallin was reconstituted. (in cooperation with Dr. K. Malinowski)

As an off-shoot of immunochemical studies on the molecular evolution of lens proteins, a new method for quantitative precipitin tests was developed (with Dr. K. Malinowski). It was based on (1) ultrafiltration of the antigen-antibody precipitates through silver membranes of 0.2 μm pore size in a specially designed multisample apparatus, and (2) spectrophotometric determination at 210 nm of the amount of proteins in the antigen-antibody precipitates dissolved in 0.1 N HCl. The new technique was found to be as accurate as the standard technique. It allows completion of analysis within only 5-6 hours. The standard precipitin technique, by contrast, requires a 5-7 day reaction period for completion.

The first stage of studies on corneal transplantation in rats with adjuvant arthritis were concluded (in cooperation with Dr. J. Santamaria II). It was found that in contrast to normal controls in the same inbred strain, the arthritic animals showed distinct reactions after syngeneic intralamellar 2 mm corneal transplants.

Dr. Konrad C. Hsu (Emeritus Professor) in conjunction with Drs. Armand F. Miranda (Pathology) and Eugenia T. Gamboa (Neurology) investigated the susceptibility of human skeletal muscle culture to influenza virus infection. Cultured post-fused human skeletal muscle monolayers exposed to WSN influenza A virus were analyzed by scanning and transmission electron microscopy. At 12-14 h post-inoculation (p.i.), affected mononuclear cells retracted from the cell surface, but remained anchored to the substrate by taut filar processes. Retraction was accompanied by the shortening of microvilli, appearance of hemispherical cytoplasmic protrusions and corrugation of the surface proper. These changes were more pronounced at 24 and 48 p.i. The rounded, moribund mononuclear cells eventually detached from the substratum. Surface alterations were accompanied by the intracellular appearance of

electron-dense nuclear inclusions (often associated with the nucleolus) and paracrystalline ribosome-studded cytoplasmic bodies, which increased in size and number with time. In myotubes, distinct surface alterations appeared later (24 h p.i.). Early myotube retraction was accompanied by accentuation of the longitudinally oriented surface pleats and appearance of "blebs" followed by cell rounding. At 48-72 h, many myotubes detached from the substratum. The surfaces of those still adhering appeared corrugated. Intranuclear and cytoplasmic inclusions accumulated, and the budding virions, often filamentous, could be demonstrated at the plasmalemma of mononuclear cells and myotubes. Late (end-stage) cytopathic effects included clumping of chromatin, breakdown of the nuclear envelope, disappearance of cortical and endoplasmic cytofilaments, mitochondrial swelling, and vesiculation of surface membranes. The lesions leading to cell death appeared to be due to massive accumulation of virus-induced products that altered cellular metabolism, with physical and functional abnormalities of surface membranes. In Association with Dr. Ray V. Gilden and Matt A. Gonda (Frederick Cancer Research Center, Frederick, Md) and Dr. Hans Hager (Hoffman La-Roche Laboratories, Nutley, N.J.) studies of the localization of gp70 and p30 murine type C virus antigens were continued using a novel three-layer immunological bridge technique. Goat anti-RLV gp 70 or anti-p30 was used as the primary antiserum; Rabbit anti-goat was applied next as the sandwich serum; and followed by goat anti-whelk hemocyanin (busycon canilatum) and hemocyanin. The findings by scanning and transmission electron microscopy agreed with data obtained immunolates, immunoperoxidase and immunoferritin methods, i.e., gp70 was localized on the virion envelope and on the cell surface but no labelling occurred on either the virion or cell for p30 which is a major core protein. In collaboration with Drs. Nicholas A. Romas (Urology) Myron Tannenbaum and Philip Tomashefsky (Pathology) up to the end of 1978, 2554 samples of serum and 200 samples of bone marrow from patients with prostatic involvements were examined by counter immunoelectrophoresis (CIEP) for the detection of levels of human prostatic acid phosphatase (HPAP) using antiserum against HPAP obtained from benign human prostatic tissue, prepared in rabbits or goats. The results showed good correlation with patients' clinical diagnosis and indicated sensitivity comparable with that obtained by radio-immunoassay.

Dr. Beatrice Seegal (Emcritus Professor) is participating in a project directed to assessing the role of the enzyme acid phosphatase in facilitating the early

recognition of human carcinoma of the prostate. This involves the use of an antiserum specific to the enzyme of prostatic origin, and counter immunoelectrophoresis. The value of this enzyme as a warning signal is being examined in some 2,700 patients and controls, using the technique already described by Dr. Hsu.

Dr. Dean L. Engelhardt's laboratory during the course of the year completed experiments that demonstrated the molecular basis for the control of the production of specific proteins that occurs as cells cease growing. This mechanism includes preferential utilization of specific mRNA species that have a higher capacity for recruitment into the population of functioning messengers. Since all cells have the capacity to grow experiments are now in progress to determine the universality of this mechanism.

This laboratory is also studying the loss of replication potential (senescence) in human fibroblasts and mouse melanoma cells. In both cases this loss of replication potential is accompanied by the increased production several major-abundance proteins. The model is that this loss is one of the manifestations of a "terminal different" event and that the production of major abundance proteins is another manifestation of the same event and are currently studying the signals for such an event. This work is being done in collaboration with Dr. Jeffrey Laskin.

Finally this laboratory is studying the biosynthesis of Y-base, a hypermodified guanine located adjacent to the 3' end of the anticodon of phenylalanyl-tRNA and have found that methionine and lysine are immediate precursors. Methionine contributes methyl groups and lysine possibly the ring carbons through the oxidized product α amino adipic semialdehyde. Work is progressing in identifying the enzymes active in this pathway. This work is being done in collaboration with Mr. Robert Pergolizzi and Dr. Dezider Grunberger.

The laboratory of Dr. Marcia J. Ensinger is engaged in the isolation and characterization of temperature-sensitive mutants of vaccinia virus. The ultimate goal of this research is to use these mutants as tools in the study of vaccinia virus replication and regulatory mechanisms. Forty-two mutants have been isolated from mutagenized viral stocks. These mutants are now being characterized genetically by complementation and recombination experiments; a qualitative complementation test based on an infectious center assay has been developed to facilitate this analysis. Preliminary experiments to identify the functional defects of the mutants has revealed that two of the first 28 mutants do not synthesize viral DNA at the nonpermissive temperature. Further biochemical characterization of these mutants is

being initiated at the present time.

Dr. David Figurski's laboratory is studying the replication of bacterial plasmids belonging to the P-1 incompatibility group. These plasmids have the remarkable ability to transfer to and replicate in a wide variety of gram-negative bacteria. Our objective is to determine not only the gene functions required for the extensive host range, but also the means by which these genes are expressed efficiently in a variety of hosts. One plasmid, RK2, is the focus of our current studies. This plasmid has the unusual feature that its genes for replication in *Escherichia coli* are not clustered on its genome. At least one gene codes for a product that will act *in trans* to promote replication of a DNA segment that carries the RK2 origin of replication. Another RK2 gene product is toxic to *E. coli* cells unless it is controlled by a separate plasmid gene. We are currently trying to locate and characterize these and other required regions of the genome by a combination of the techniques of gene cloning and mutagenesis. This will permit detailed studies on the precise functions of these gene products and the means of their control.

The research in Dr. Ramareddy V. Guntaka's laboratory is directed towards understanding regulation of gene expression using RNA tumor viruses as a model system. In particular our emphasis is to understand the mechanism by which the host RNA polymerase II preferentially transcribes viral genes in cells productively infected and in some cases transformed by an RNA tumor virus although the same enzyme transcribes only a few copies of cellular mRNA of a given species. From the studies on *E. coli* RNA polymerase holoenzyme binding studies, it is thought that the selection occurs because of the presence of a regulatory element within the viral genome. The clues for the existence of such an element came from restriction enzyme studies which were carried out in collaboration with Dr. John Taylor and his associates of the Institute of Cancer Research in Fox Chase and also with Drs. P. Shank and Harold Varmus of the University of California at San Francisco. Now we have generated physical maps for at least 10 restriction enzymes. Two very important features have come out of this work: 1) In infected cells, during the process of reverse transcription of genomic RNA into DNA, a terminal redundancy of about 600-800 base pairs (bp) in the linear form and a 300 bp in the circular form has been generated from a single copy in the RNA and 2) integration into host cell DNA appears to be at a unique site in the viral DNA and random in host cell sequences. Further studies with a single-strand specific nuclease *s1* also revealed a local unwinding in the circular viral DNA molecule at a site which is

close to the integration site.

Taking advantage of the specificity of *E. coli* RNA polymerase holoenzyme for promoter regions, Dr. Prasad, research associate, Richard A. Katz, graduate student, and Dr. Guntaka were able to isolate a promoter of 35 base pairs. Further the laboratory was able to map the promoter site on the genome which turned out to be in the common (C) region (3' end). Hope is expressed to identify the second identical promoter, which should be present on the 5'-end of the linear DNA molecule by employing restriction enzyme fragments and the *E. coli* RNA polymerase.

The studies which were done in collaboration with Dr. Erlanger, to map the integrated viral genes by immunochemical techniques have been progressing extremely well. The approach involves synthesizing virus specific cDNAs by reverse transcriptase, tagging the cDNA with tails of poly 5 methyl cMP by terminal transferase. Following *in situ* hybridizations to intact metaphase chromosomes we hope to localize by reacting with anti-5mC antibody which in turn will be visualized by immunoperoxidase technique.

Mr. Katz, Dr. Prasad, Lewis Yesner, Amy Weiner, Geryl Jackson and Dr. Guntaka also carried out extensive work on the role of methylated bases in virus production. Treatment of avian sarcoma virus-transformed chick embryo cells with 5 methylcytidine allowed synthesis of more than normal levels of viral mRNA and virus specific proteins but depressed virus yields several fold. In order to understand this unique phenomenon we have determined the rates of poly A⁺ and poly A⁻ RNA synthesis in the presence and absence of 5mC and found that only poly A⁻ (mainly ribosomal RNA) was inhibited despite the same levels of 5mC incorporation into both types of RNA. In addition, ribosome formation was also blocked. The inhibition of virus production as well as ribosome formation has led to formulate a working hypothesis which is that methylation of RNA, somehow, altered the affinity and specificity of the protein to interact with RNA.

Methylation of DNA appears to have a major role in the regulation of gene expression. In two lines of rat tumor cell genes, ribosomal genes seem to be amplified. In work done in collaboration with Mrs. Uma Tantravahi and Dr. O.J. Miller of Human Genetics, we have found that in a rat hepatoma (H4) line about 10-20 fold and in a rat sarcoma (XC) about 5-8 fold amplification of ribosomal genes. Digestion of H4 DNA with *EcoRI* generates 6 distinct bands, all of which contained ribosomal DNA and most of these were heavily methylated. ¹⁴C-methyl methionine labeling and digestion with a restriction enzyme *HhaI*, which does not cleave at 5mC containing site, confirmed unique methylation pattern in ribosomal

genes. In order to understand the regulation of gene expression by methylation carrying out restriction enzyme analysis on avian RNA tumor virus DNA before and after its integration. Alex Mitsialis, graduate student, Dr. Prasad and Dr. Guntaka have observed that HhaI, which cleaves the unintegrated viral DNA at least at 2 or 3 sites, does not cleave at all the integrated DNA. However when the cells were grown in ethionine, an analogue of methionine which inhibits methylation, the viral DNA appears to be sensitive to this enzyme. As anticipated, the number of viral mRNA copies per cell increased from 200 to 300 to about 1000 to 1500 in ethionine-treated cells suggesting a major role for methyl groups in gene inactivation.

Research in Dr. Christine A. Milcarek's laboratory is aimed at the elucidation of some of the mechanisms of the regulation of mRNA processing, both in the cytoplasm and in the nucleus of eucaryotic cells. Analysis of this regulation will aid our understanding of how cells grow and divide. Two primary aspects of mRNA processing are being investigated.

(1) The first focuses on the role of poly A addition and mRNA utilization. In HeLa cells we have found three classes of mRNA: a) those that are exclusively found as poly A containing molecules (b) those that are found only in a poly A deficient form and (c) those which are found in both the A^+ and A^- fractions. The existence of these three classes has been ascertained by nucleic and hybridization studies. The mRNA which is exclusively poly A minus contains internal oligo A's of approximately 6 to 7 A residues. This oligo A is missing from poly A plus mRNA. In *Drosophila* embryos and cells the state of adenylation of the histone mRNA's has been investigated. Histone mRNA's have been found to be bimorphic with respect to poly A by *in vitro* translation of isolated mRNA and analysis of the protein products. The fate of these two classes of histone mRNA is being studied by hybridization of radioactively labeled RNA with histone specific DNA cloned in bacterial cells.

In addition, Curtis Brandt, graduate student, has found that *Drosophila* cells profoundly alter their cytoplasmic RNA processing after a high temperature (37°C) shock. Pre-existing RNA is destroyed while new RNA species are being elaborated. The heat shock response is accompanied by a cell cycle specific block which causes the cells to accumulate in late S or early G_2 . The nature of this block is being investigated.

(2) The role of nuclear processing of heavy chain immunoglobulin mRNA is being investigated in mouse myeloma cells. Variants of MPC-11 line 45-6 have been isolated by Dr. S.L. Morrison which now

produce internally deleted proteins. Raymond Monk, graduate student, has analyzed the mRNA from these variants and have found that the messages themselves are much shorter implying internal deletions in the mRNA. These deletions most likely have occurred at the hnRNA to mRNA splicing steps. We are investigating the mRNA deletions by hybridizing variant RNA with cloned heavy chain immunoglobulin DNA molecules and visualizing the hybrids in the electron microscope. We hope to determine the exact sites and the nature of the mRNA deletions in order to understand immunoglobulin mRNA production.

The research being carried out in Dr. Sherie Morrison's laboratory continues to be directed at gaining a greater understanding of the genetics and biochemistry of immunoglobulin synthesis. To achieve this objective, the laboratory has established continuous cell lines from mouse myeloma cells which are synthesizing large amounts of homogeneous immunoglobulin. Using these cell lines, the laboratory isolated and characterized cells which are mutant in their production of immunoglobulin.

A major research effort in the laboratory has been the isolation of mutants from antigen binding IgA myelomas. Linda Matsuuchi, a graduate student in the laboratory, has been studying the cell line J558, a myeloma producing an IgA, paraprotein with specificity for 1→3 linked dextran. When J558 is cloned in soft agar and overlaid with dextran (200 μ g/plate) a precipitate forms over the growing clone if it continues to produce immunoglobulin which binds dextran. Using this method it is possible to identify and isolate clones which no longer bind antigen. Mutants have been isolated from J558 which bind antigen less well than the parental line. Further characterization of these mutants is in progress.

Mutants altered in their ability to secrete Ig also have been isolated from J558. Two mutants have been isolated which secrete normal amounts of L chain but little H chain; a third mutant has been isolated which secretes normal amounts of L chain and no heavy chain. The heavy chain produced by the third mutant is twice the molecular weight of normal H chain. Peptide map analysis reveals no major differences between the parental and the mutant H chain. The mutant binds antigen, but not as well as the parent. Both the wild type and the mutant H chains are glycosylated; however, extra carbohydrate on the mutant chain does not account for the apparent molecular weight differences. Revertants which secrete H chain have been isolated from this line; these revertants synthesize normal sized H chain.

Variants have also been isolated from W3129, a IgA, k myeloma with specificity for 1→6 dextran, which either produce only H chains and no detectable

L chains, and or only L chains and no H chains. Both H and L chain producing clones do not secrete their Ig. From the H chain producing variants of W3129 it has been possible to isolate revertants which secrete their H chains. These revertants are of two different phenotypes: those that secrete a deleted H chain, and those which are now synthesizing a L chain. Two independent deletion mutants have been isolated; they are of the same apparent molecular weight and no differences can be detected by peptide map. Three L chain synthesizing clones have been isolated. One of these is now synthesizing both a heavy chain and a L chain which differ from those of W3129. This line does not bind antigen and does not react with anti-idiotypic antiserum. The second variant synthesizes a heavy chain apparently identical to that of W3129; however, its L chain differs from both the L chain of W3129 and that of the first mutant. The second variant binds antigen, but not as well as the parental line. The third L chain synthesizing clone has not been characterized.

The Ig system is one of the few eukaryotic systems in which structural variants of a protein potentially can be isolated and characterized. One drawback in using Ig production to investigate mutagen action has been the high spontaneous variation rate which is observed. However, Dr. Morrison's group recently adapted to continuous growth in tissue culture the Y5606 myeloma which appears to have a lower spontaneous rate of variation than do the other myeloma lines. Treatment of this cell line with known mutagenic substances increases the mutation rate approximately 100-fold over the background rate. Following EMS mutagenesis approximately half of the isolated mutants are phenotypically distinct from the spontaneous mutants. Characterization of these mutants is in progress in an attempt to define the mechanism of action of EMS in producing these mutants.

Characterization of variants isolated from the γ_{2b} 45.6 cell line has continued. Isolation of structural variants from the 45.6 cell line began with the identification of 10-1, a cell line synthesizing an internally deleted heavy chain. Secondary mutants of two types have been isolated from 10-1: 1) mutants which synthesize heavy chains of molecular weight 55,000 daltons, but which are serologically γ_{2a} , and 2) mutants which synthesize heavy chains smaller than the heavy chains of 10-1. From the second class of mutants it has been possible to isolate tertiary mutants which are serologically γ_{2a} and produce heavy chains with molecular weights of either 47,000 or 55,000 daltons.

In experiments done in collaboration with Dr.

Christine Milcarek and Raymond Monk, student, it has been determined that 45.6 and all of the variants derived from it, synthesize heavy chains which are glycosylated; *in vitro* translation of mRNA from these cell lines in a wheat germ system shows that all of the heavy chains also have a precursor form. Studies also indicate that the mRNA of the H chain of 10-1 and variants derived from it is smaller than the mRNA for the H chain of 45.6. cDNA clones for the H and L chain of 45.6 have been obtained from Dr. Robert Perry, and further analysis of the molecular events leading to mutation in Ig production in the 45.6 cell line will be done in collaboration with Dr. Milcarek.

Dr. Saul J. Silverstein during the past year has had two major areas of interest. One is concerned with the inhibition of host protein synthesis by animal viruses. The other is to understand the mechanisms involved in the regulation of expression of foreign genes when placed in a new environment. This process is known as transformation. One of the consequences of productive infection of animal cells with animal viruses is the rapid shutdown of cellular protein synthesis. Shortly after infection, cells begin to selectively synthesize virus specified polypeptides. Different viruses appear to effect this property in different ways. In this laboratory we have analyzed this process by examining what happens to the protein synthetic apparatus of animal cells following infection with either herpes simplex virus, a large double-stranded DNA containing virus, or with vesicular stomatitis virus an RNA virus. Our studies during the past year have demonstrated that the selective switch from synthesizing cellular polypeptide to viral polypeptides is modulated differently by these two viruses. In cells infected with VSV there is a rapid shift towards the synthesis of viral specified proteins without drastic changes in the cellular protein synthetic apparatus. On the other hand in cells infected with herpes simplex virus drastic alterations in the protein synthetic apparatus occur. These alterations are seen as degradation of cellular mRNA and the dissociation of cellular polyribosomes shortly after viral infection. Our other area of interest, results from a recent observation made in this laboratory that it was possible to isolate a restriction endonuclease generated fragment of herpes simplex viral DNA that contained the gene coding for the enzyme thymidine kinase. This piece of DNA was inserted into recipient thymidine kinaseless mammalian cells. The effect of introducing this gene was to repair a genetic deficiency of this cell. As a logical extension of this work we have begun to transfer other genes between different species. In this way it may be possible to be

able to dissect complex cellular phenotypes and to begin to attempt to understand what controls gene expression in eukaryotes.

Dr. Hamish Young's laboratory is concerned with the mechanism of recombination in human adenoviruses, using temperature-sensitive and host-range mutants, differences in polypeptide size and antigenic specificity between serotypes, and alterations in restriction endonuclease sites as genetic markers. Since adenovirus DNA is infectious, modifications can be made to the DNA before it is used to infect cells. Fredric C. Volkert is examining the DNA infection system to test whether or not it is suitable for testing the role of mis-match repair in recombination. If this is successful, a range of putative recombination substrates and intermediates can be administered to cells. We have also examined the role of the host cell in promoting recombination, testing a range of human cell types deficient in one or another aspect of repair. To date, cells from patients with *Xeroderma pigmentosum*, *Fanconi's* anemia and Bloom's syndrome have been tested. None show adenovirus recombination deficiency although Bloom's cells exhibit higher levels of recombination. The role of carcinogens and tumor promoting agents in stimulating recombination is also being examined in collaboration with Drs. Paul B. Fisher and I. Bernard Weinstein, Institute for Cancer Research.

Activities and Honors

Dr. Ginsberg presented seminars at the Rockefeller University, University of Arizona, and University of Colorado School of Medicine. He was appointed Chairman of the Microbiology and Infectious Diseases Advisory Committee of the National Institutes of Allergy and Infectious Diseases, Chairman of the Microbiology Examination Committee of the National Board of Medical Examiners, and Chairman of the National Institutes of Health Advisory Committee to Recommend Revised Guidelines for Use of Viruses in Recombinant DNA Research. He also served as a member of the European Molecular Biology Organization-National Institutes of Health Virus Task Force, the American Society of Microbiology Recombinant DNA Task Force, the Research Advisory Council of the American Cancer Society, and the Board of Scientific Advisors of the National Jewish Hospital (Denver, Colorado). Dr. Ginsberg is an Editor of *Intervirology* and *Cancer Research*, and serves on the Editorial Boards of the *Journal of Virology* and *Comprehensive Virology*.

Dr. Erlanger presented seminars at the National Institutes of Health in Bethesda, Maryland, New York Medical College in Valhalla, New York, Cornell University in Ithaca, Lady Davis Institute in

Montreal, Canada, Yale University at New Haven, University of Vermont at Burlington, Harvard Medical School in Boston, Brandeis University in Waltham, Mt. Sinai Medical Center in New York City, Smithsonian Institution in Rockville, Gordon Conferences in New Hampton, New Hampshire, and the Institute of Cell Biology in Shanghai and the Chinese Academy of Sciences in Peking, China.

Dr. Ellner presented lectures at: the Annual Maine Biomedical Science Symposium, University of Maine; the Department of Internal Medicine, Lausanne, Switzerland; the New York Medical College, Valhalla, New York; the New York City Chapter of the American Society for Microbiology, New York; and the Crozer-Chester Medical Center, Chester, Pennsylvania.

Dr. Kabat was invited to deliver a paper at the dedication Symposium of the International Laboratory for Research in Animal Diseases in Nairobi in April. In September he spent three weeks lecturing and visiting laboratories in the People's Republic of China at the invitation of the Institute of Biophysics of the Chinese Academy of Sciences and in December participated in a WHO course at the Weizmann Institute in Rehovot, Israel. He also participated in a teaching film on Immunology prepared by the British Broadcasting Company's Open University. Several anecdotes from his association with Michael Heidelberger and Karl Landsteiner are published in *Trends in Biochemical Sciences*.

Dr. Pernis has given the following seminars and lectures: seminar at the Roche Institute, Nutley, New Jersey; lecture at the New York Rheumatism Association; seminar at the Albert Einstein College of Medicine, New York; seminar at the St. Jude's Children's Hospital, Memphis, Tennessee; seminar at the University of Tennessee, Microbiology Department; lecture at the Cornell University 5th Annual Strasburger Symposium, New York; seminar at Sloan-Kettering, Rye, New York; seminar at the University of Washington; lecture at the 6th International Convocation on Immunology, Niagara Falls, New York; and a seminar at the Columbia University Immunology Rounds.

Dr. Hsu during May and June, 1978 was a Visiting Professor at the Shanghai Institute of Cell Biology and Institute of Biochemistry. He was officially received on June 15, 1978, in the Hall of the People, Peking, by Vice Premier Fang Yi of the People's Republic of China and Director Tung Di-Chou of the Institute of Animal Physiology, both in the capacity as Deputy Directors of Academia Sinica.

Dr. Silverstein received a Research Career Development Award from the National Institutes of Health and was invited to speak at Yale University, The

University of North Carolina, The University of Virginia and the Johns Hopkins University.

Dr. Figurski was invited to speak at the University of Rochester, University of Louisville, and the Public Health Research Institute of the City of New York.

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Acknowledgements

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Neurological Surgery

EDWARD B. SCHLESINGER

Byron Stookey Professor and Chairman of the Department • Director of Service

The Department of Neurological Surgery welcomed the addition of Dr. Donald Quest and Dr. George DiGiacinto to its teaching and clinical staff. Dr. Quest received his neurosurgical training here and joined our former resident, Professor William Shucart, at Downstate Medical College for a period of two years before returning. Dr. DiGiacinto, after finishing his training program with us joined the group of neurosurgeons serving our sister institutions, St. Luke's, Harlem and Roosevelt Hospitals and his appointment represents a sincere attempt to create a closer liason with our colleagues at those institutions.

The resident staff continued its outstanding performance under the stress of increased activity and demands, related both to a larger work load and greater emphasis on research. The limitations imposed upon the department by governmental fiat so that resident numbers cannot be increased in spite of obvious need, has been one of the Department's major problems during this period of greatly increased activity. It is to the credit of the residents that they have performed at a consistently high level in spite of the increased burden. It is also notable that the resident group has regularly been represented by excellent papers at the national meetings. Dr. Martin Luken, a third year resident, won the gold medal of the Congress of Neurological Surgery for his paper on Spontaneous Dissecting Aneurysms of the Extracranial Internal Carotid Artery.

After a long period of gestation, the Departmental laboratories were opened this year and represent an

important new dimension of departmental activities. Many projects hitherto carried out under difficulty inherent in lack of laboratory space, now are returning to their own base. The resident laboratory, both for experimental work and training in special techniques such as microsurgery, has been in constant use, demonstrating its essentiality in preparing young individuals for the practice of present day neurosurgery. Dr. Quest has been active in setting up the resident program in this area.

Departmental activities continue to make themselves increasingly felt in the national forum. A very high proportion of members of our faculty and resident staff have participated at all the national neurosurgical meetings. Department members have also been increasingly active in the management of the affairs of the national societies, an important effort in making a valid impact on the course of decision making for the specialty.

Dr. John Antunes, with the assistance of Dr. DiGiacinto, has taken over the preparation of the programs for Grand Rounds. The year's teaching activities have been most successful. Among the Visiting Professors were: Dr. Harold Hoffman (Hospital for Sick Children, Toronto, Canada); Dr. Jerome Posner (Department of Neurology Memorial Hospital); Dr. Donlin Long (Department of Neurosurgery, Johns Hopkins Medical School); Dr. Gerald Hochwald (Department of Neurology, New York University School of Medicine); Dr. Ronald Apfelbaum (Department of Neurosurgery, Albert Einstein College of Medicine); Dr. Robert White (Department

of Neurosurgery, Case Western Reserve University); Dr. Robert B. King (Department of Neurosurgery, State University, Syracuse); Dr. William Shucart (Department of Neurosurgery, Downstate Medical Center). The tradition of inviting outside individuals to join departmental activities and participate in Grand Rounds, includes an opportunity for the resident staff to lunch with the Visiting Professor. These close contacts have and will prove invaluable to the resident staff, both in observing appropriate models and in cementing friendships with outstanding members of their profession.

The teaching collection continues to grow with the assistance of our dedicated and faithful Mrs. O'Leary, who has been diligently putting together all the pertinent neurosurgical records and teaching files so that they are readily available in the resident lounge. She has also been busy preserving the important historical records of the Department, of which we are justifiably proud. Dr. Housepian, with his known interest in audio-visual techniques, has also added immeasurably to departmental teaching material. He continues to broaden the usefulness of audio-visual techniques, both in the Department, in the Institution, and nationally.

Dr. Mount, in his purported academic retirement, continues to function as effectively and helpfully as ever and has continued to be a source of strength to the Department both in his clinical teaching and his service on important committees.

Dr. Correll maintains his research interests in cerebrovascular disease and fat metabolism and has been taking appropriate measures to utilize the newly available laboratory space. His responsibilities in that regard include overall supervision of the laboratory.

Drs. Housepian and Brisman represent the Department in the gratifying effort to develop a major Cancer Center. Department members have been most cooperative and anxious to aid the development of that important aspect of the field of neurosurgery. I would like to take this opportunity to congratulate Dr. Marks and the other members of the cancer steering group who have brought to fruition, after much effort, the present excellent institutional effort.

Dr. McMurtry continues his interest in aneurysms of the posterior circulation and has been an excellent clinical preceptor, particularly in his teaching of operating room skills. He has worked very hard to bring his Lenox Hill Service to a high degree of clinical practice and our continuing intimate relationship with that service has been of value to our department.

Dr. Carmel and Dr. Antunes, as part of the neuroendocrine research group have become important contributors to the understanding of

hypothalamic and pituitary mechanisms, and their papers have had a most gratifying reception in various national and international forums.

Dr. Housepian has for a long time shown great interest and special skills in the combined neurosurgical-ophthalmological area. He has given the department an outstanding resource both in the clinical and experimental aspects of these complex problems.

Dr. Michelsen, in conjunction with Dr. Hilal of the Department of Neuro-radiology, has amassed an enormous amount of information and clinical experience in the field of vascular anomalies of the brain and spinal cord. The opportunity for helping patients with a wide variety of lesions, which till recently were inoperable, represents one of the truly important advances in neurosurgical and neuroradiological treatment.

Dr. Bridges continues his interest in pain, a very important aspect of neurosurgical responsibility, and with Dr. Brisman, who shares that interest, has been available for the treatment of patients with intractable pain. The Department is anxious to increase our participation in this area in order to be of greater service in an essential field. Dr. Bridges, with his special brand of loyalty and faithfulness to the Department, has continued his teaching rounds without interruption for many years, for which both the attending and resident staff are most grateful.

Dr. Brisman has taken on many difficult departmental obligations, such as utilization review, in addition to his involvement in Cancer Center activities and the management of pain. He has always been prompt and effective in representing the department when called upon and has contributed greatly to the success of its efforts.

The addition of a new generation of neurological surgeons to our staff with major teaching and research obligations has proven very successful. Drs. Antunes, DiGiacinto and Quest have, to their credit, picked up important departmental burdens which have not only improved departmental teaching activities and obligations but have immeasurably lightened the burden of the senior members of the staff.

In summary the Department is greatly suffering from growing pains in terms of physical needs and ancillary personnel. Both of these requirements can be met in time. The problems are all problems of robustness and good health. The spirit of cooperation and conviviality of the staff has made it possible to broaden the spectrum of specialty activities within the Department. This is important because one of the goals of the department has always been to offer service of a high degree of sophistication to the total spectrum of neurosurgical techniques.

With the end of the year Dr. Gerald Kadis will be leaving for practice in Thomasville, Georgia, under what seems to be most exceptional auspices. Dr. Stephen Dell will be joining Professor Bennett Stein at Tufts as one of his departmental group. Dr. David Kvam will remain with us as a Stocks' Fellow. The

department would like to take this opportunity to thank the many donors who have made much of its activities possible, particularly at a time of economic stress and inflation.

We also would like to humbly thank our nursing associates for their invaluable aid and good will.

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Neurology

LEWIS P. ROWLAND

Moses Professor and Chairman of the Department • Director of Service

Teaching

Professor Lucien Coté continued to coordinate chemical aspects of the Neural Science course for the second-year students. He and other members of the Department gave lectures and supervised 27 groups of 5 students each for instruction at the bedside. One hundred and fifty students in the major clinical year took the 5-week neurology clerkship at the Neurological Institute under the direction of the clerkship administrators, Drs. Stuart Snider and E.A. Zimmerman.

Sixty-five senior medical students took senior electives at the Neurological Institute: 37 substitute interns, 17 consultation electives and 11 in preceptorships in the practice of neurology. 32 were from other medical schools. Nineteen P & S students took electives in neurology at Harlem Hospital and 12 took neurology at other affiliated hospitals. Nineteen P&S students also took an elective in pediatric neurology. Eight P & S students took the seminar course in Concepts in the Neurology.

Graduate Medical Education: 23 physicians served as residents in the adult neurology training program at Presbyterian Hospital and the Harlem Hospital Center. Eight physicians served in the pediatric neurology training program at Presbyterian Hospital; two were supported by the department and one came from the U.S. Navy.

In addition to the usual lectures and conferences, Professors Coté, Reuben, and Housepian organized a weekly review course in basic neurosciences for clinicians. This course and departmental Grand

Rounds are accredited for Continuing Medical Education.

Research

Epilepsy Research

Drs. Goldensohn, Hans Lueders, Luis Bustamante, Charles Pippenger, Alex Siafakas and Mr. Leonard Zablow reported on their work in defining differences in action of various anticonvulsant agents on electrical fields produced by highly discrete epileptogenic foci. They are continuing their investigations on the subject. Drs. Goldensohn, Stanley Resor, Ronald Brisman (Neurosurgery) James Correll (Neurosurgery) and Charles Pippenger are collaborating on the evaluation of patients who are candidates for surgical treatment of epilepsy. Alfred Salazar, Leonard Zablow and Dr. Goldensohn completed a study of the intracellularly recorded activity and surface phenomena in discrete epileptiform foci. Drs. Kazuo Aoyama and Ms. Ruth Koehle studied the origin of uncal spindles in man.

Professor Emeritus Masland and Dr. Stanley Resor are evaluating new anticonvulsant drugs (valproic acid, nitrazepam, and cinromide) in clinical trials. Drs. Hauser and Shafer, with Dr. Mervyn Susser (School of Public Health), initiated epidemiological studies of epilepsy.

Under the direction of Dr. C. E. Pippenger, the Edwin S. Weisl Senior Laboratory for the Analysis of Antiepileptic Drugs has continued to elucidate the clinical pharmacology of antiepileptic drugs, emphasizing (1) improved quality control of all an-

antiepileptic drug determinations throughout the nation, and (2) pediatric pharmacology in relationship to antiepileptic drugs to seizure control in children. The national Antiepileptic Drug Levels Quality Control Program was launched successfully and will be assumed by the American Association of Clinical Chemists. The pediatric program includes studies of the relationships of serum concentrations to seizure control in neonates, with Dr. Tove Rosen (Pediatrics); relationships of seizure control to neonatal seizures, Dr. Michael Painter, McGee Women's Hospital (Pittsburgh); and study of patients above the age of one year.

Parkinson's Disease Research

Drs. Stanley Fahn, Stuart Snider, Lucien Coté, and Robert Barrett evaluated the efficacy and toxicity of bromocriptine in treatment of parkinsonism. They also conducted a survey of all patients in the Movement Disorder Clinic receiving optimum dosage levodopa therapy for parkinsonism. Their analysis of the clinical problems and the complications of longterm levodopa therapy led to the conclusion that the medication itself contributes to the loss of effectiveness as levodopa therapy is prolonged.

Dr. Ronald Lesser and Dr. Fahn evaluated patients with torsion dystonia and found that more than 40% had previously been misdiagnosed as having a conversion reaction.

Studies of the aging process in brain by Drs. Coté, Kremzner, and Duffy (Pathology) showed that enzyme synthesis in brain and muscle are not significantly different in older animals and young adults. Drs. Kremzner and Cote, in collaboration with Drs. Berl (Mt. Sinai School of Medicine) and Stellar (St. Barnabas Hospital) studied amino acids, peptides and polyamines in Huntington disease. With Dr. Clayton Natta (Medicine and Pathology), Dr. Kremzner is studying the interaction of the polyamines with red blood cells and stroma in sickle cell anemia, in which there is a ten-fold increase in polyamine levels.

Dr. Snider continued his investigations on the role of the cerebellum in parkinsonism. With colleagues at the University of Rochester and Dr. Stanley Fahn, he showed in experimental animals that there are direct interconnections between cerebellum and ascending dopamine systems. When these pathways were damaged, a levodopa-responsive dopamine deficiency state developed in the brain. Preliminary results on a promising noninvasive technique for therapeutic stimulation of the cerebellum were also obtained.

Neurovirology Research

Dr. Eugenia Gamboa worked on different aspects

of persistent viral infection. Two years after inoculation of mice, she found immunofluorescent evidence of the antigen in brain. In these animals, Dr. Coté found no alteration of catecholamine content. With Dr. Penn, Dr. Gamboa found evidence of persistent herpes simplex virus, but not other viruses, in the thymus glands of patients with myasthenia gravis. With Dr. Hays, she found that human thymic cultures can be infected by several viruses. In animals, she found that viral infection of muscle could be enhanced by administration of buvupicaine. In one patient with fatal myoglobinuria, she isolated influenza B virus from muscle.

Dr. James Miller, with Dr. Ramareddy V. Gunataka (Microbiology), continued the analysis of brain RNA for the presence of polio-virus nucleic acids in patients who died with amyotrophic lateral sclerosis. They prepared a radioactive nucleic acid probe that is complementary to the genome of poliovirus and are using it to detect the presence of the virus genetic material in brain tissue by hybridization techniques. This methodology is the most reliable one for detecting the presence of a particular virus in a chronic disease suspected of being caused by that virus.

Using a radioactive polio probe, Dr. Miller found that mice infected with poliovirus may harbor the virus for prolonged periods, even though they remain asymptomatic. These animals did not appear to make antiviral antibodies during the early stages of the infection and further investigations of this prolonged carrier state are underway to define how the infection is regulated. The relevance of this to chronic enterovirus infections in immune deficient children is also being explored.

Dr. Miller established the electrophoretic technique for examining spinal fluid of patients with multiple sclerosis to evaluate the characteristic patterns of immunoglobulin migration in this disease. The diagnostic usefulness of this test is being evaluated.

With Dr. Penn, Dr. Miller is developing an assay for the detection of immune complexes in serum and spinal fluid. This procedure will have application to the investigation of several neurologic diseases in which immune complexes may be important in the pathogenesis.

Biochemical Genetics

Dr. William G. Johnson studied the genetic and biochemical substructure of a group of new chronic hexosaminidase deficiency diseases. With Dr. Armand Miranda, isoelectric focussing of fibroblast hexosaminidase from juvenile cerebellar ataxia showed absences of hexosaminidase B ($\beta\beta$)_n, increased hexosaminidase S ($\alpha\alpha$)_n, and an abnormal

hexosaminidase A-like species believed to be $(\alpha \beta')_n$, where β' is the mutationally altered β -subunit of hexosaminidase. With Dr. Abe Chutorian, the carrier state of juvenile cerebellar ataxia was detected and traced through 4 generations of an affected family. With A. Hiatt, hexosaminidase from carriers was fractionated by isoelectric focussing. A large excess of hexosaminidase S($\alpha \alpha$)_n was found, reflecting a basic defect in the ability of the abnormal β -subunit, β' , to bind with both α -subunits and other β -subunits. The heterozygote produces both normal and defective β -subunits but the latter cannot bind effectively to the normal amount of α -subunits. The excess α 's bind together to form the large excess of hexosaminidase S.

With Professor Lovelace, Sylvia R. Rubin, and Dr. John R. Martin, Dr. Johnson described a new form of X-linked leukodystrophy which closely resembles classical Pelizaeus-Merzbacher disease. It differs however because of normal head size, decreased nerve conduction velocities and absence of characteristic eye movement abnormalities.

With Drs. Mary Murphy, William I. Murphy and Arthur D. Bloom, Dr. Johnson described the clinical features of a new form of recessively inherited cerebellar parenchymatous degeneration. This new disorder, studied in 26 patients, was found only in the town of West Bay on the Cayman Islands and was characterized by severe congenital cerebellar ataxia, mental retardation, skeletal deformities, and eye movement abnormalities.

Neuroendocrine Research

Dr. Zimmerman and colleagues are investigating brain peptide-containing pathways. Sex hormone releasing factor and reproduction were studied with Dr. Ann Silverman (Anatomy), Dr. John Antunes (Neurosurgery), and Dr. Michel Ferin (Obstetrics-Gynecology and Physiology) in monkey brain. Oxytocin pathways originating in hypothalamus have been traced to distant brain sites including spinal cord by Dr. Gajanan Nilaver (Fellow) where they may regulate autonomic and pain functions. Summer student Jennifer Michaels (Stony Brook) found that estrogens stimulate parts of the oxytocin system. Work on the vasopressin pathways with Dr. Ann Silverman (Anatomy) further established a role for this hormone in ACTH secretion which in turn causes inhibitory feedback via corticosterone in rat, possibly at the hippocampal level (in collaboration with Drs. Louis Drey and Bruce McEwen, Rockefeller University). Further studies of ACTH and endorphin informing pathways (in association with Dr. Dorothy Krieger, Mount Sinai Medical Center, N.Y.) have established that cells in the hypothalamus synthesize these pep-

tides and export them to other brain regions to regulate pain and possibly memory.

H. Houston Merritt Clinical Research Center for Muscular Dystrophy and Related Diseases

With Dr. Patricia Hartlage (Medical College of Georgia), Prof. DiMauro studied a variant of muscle phosphorylase deficiency which was different from McArdle disease. Generalized weakness started at age 4 weeks, was fatal at age 13 weeks. The enzyme defect in muscle was proven by histochemical and biochemical assays, confirmed by studies of anaerobic glycolysis; immunological investigations showed lack of immunoreactive enzyme protein. With colleagues at other universities and with Drs. Arthur Hays, Abraham Eastwood, Marcelo Olarte, Michael Fetell and Richard Schoenfeldt, Dr. DiMauro described a syndrome of adult-onset, slowly progressive myopathy in five patients with debrancher deficiency. This condition was previously reported only in two patients.

With Dr. Joseph Willner, Dr. DiMauro studied carnitine transport in freshly excised longitudinal strips of human muscle obtained at biopsy. In the presence of ^{14}C -inulin as a marker for extracellular space, this experimental procedure proved to be satisfactory and the characteristics of carnitine transport by human muscle appeared to be similar to those of intact tendon-to-tendon rat muscle preparations. This procedure was used in the first study of carnitine transport in a patient with muscle carnitine deficiency and lipid storage myopathy. Carnitine transport was normal in this patient, suggesting that pathogenetic mechanisms other than a defect of carnitine transport must be responsible for carnitine deficiency myopathy in some patients.

With Drs. Armand Miranda, Eastwood, Hays, William Johnson, Olarte, Whitlock, Richard Mayeux and Rowland, Dr. DiMauro described a patient with what appears to be a distinct entity characterized by lipid storage myopathy, ichthyosis and steatorrhea. Lipid storage, first noted in fibroblast and muscle cultures, was also found in muscle biopsy and leukocytes. Thin-layer chromatography of cultured fibroblast extract showed a 20-fold increase of triglycerides. The enzyme defect in this generalized disorder of lipid metabolism remains elusive.

With Dr. Jerry R. Mendell, Ohio State University, Dr. DiMauro studied the second case of a new mitochondrial myopathy characterized by an almost complete lack of cytochrome c-oxidase and a partial defect of cytochrome b in muscle mitochondria.

With Visiting Fellow C. Cerri, Dr. Joseph Willner identified factors responsible for one thermal lability

of adenylate cyclase in isolated sarcolemma. They confirmed the subnormal responses of the enzyme to catecholamines in muscle from patients with Duchenne dystrophy and found similar abnormalities in asymptomatic carriers of the gene. With Dr. D. Wood, Dr. Willner studied regulation of calcium transport in relation to adenylyl cyclase in normal muscle and in malignant hyperthermia.

Drs. Kremzner, Miranda, and Tennyson found that muscle polyamine content was increased in Duchenne dystrophy, but not in myotonic dystrophy. They also studied the role of polyamines in muscle cell fusion.

With Dr. A. Miranda (Pathology), Dr. M. Schonberg improved the cell culture and cyclic AMP assay conditions of human fibroblasts, finding decreased catecholamine-sensitive accumulation of cyclic AMP in Duchenne dystrophy fibroblasts. With Drs. J. P. Bilezikian (Medicine) and H. Sommer (Fellow) he observed that catecholamines can reversibly and stereospecifically desensitize β -adrenergic responses of adenylate cyclase, CPK, and myoblast fusion in the rat myogenic cell line L₈. With Dr. A. Miranda, he observed that dimethyl sulfoxide (DMSO), applied to proliferating L₈ myoblast cultures, inhibited cell fusion; stimulated accumulation of cyclic AMP by catecholamines was indistinguishable from controls, although other differentiation characteristics, such as collagen and CPK synthesis, were affected. With Dr. Kupfermann, Dr. Schonberg supervised the work of D. Mandelbaum on serotonergic modulation of contractility in *Aplysia*, finding that this modulation is mediated by cyclic AMP. Cyclic AMP promoted phosphorylation of at least 3 proteins. This work merited an award for Mr. Mandelbaum at the Dean's Day for Medical Student Research.

With Drs. George M. Katz and Angel Mozo, Dr. John Reuben studied contractile protein interactions in single intact and skinned muscle fibers employing light scattering techniques.

With Drs. Martha M. Sorenson and Katz, he determined the characteristics of the sarcoplasmic reticulum in normal and diseased human single fibers by light scattering measurements, and with Dr. Guilherme Suarez-Kurtz, he studied the factors that control the loss of soluble enzymes from intact muscle. Single muscle fiber techniques were developed for studying both contractile and Ca-regulating systems in normal and diseased states by Drs. Reuben and Philip W. Brandt (Anatomy).

Dr. Martha Sorenson studied sarcoplasmic reticulum and contractile protein function in normal and diseased human single fibers (Drs. Reuben, Donald S. Wood and A. Eastwood). She compared

sarcoplasmic reticulum and contractile protein characteristics in mammalian fast and slow-twitch fibers with Drs. Wood and Eastwood, and she analyzed permeability control mechanisms in isolated sarcoplasmic reticulum membranes.

In skinned fibers, Drs. D. Wood and A. Eastwood studied the cellular basis for muscle weakness in Duchenne dystrophy. Dr. Wood studied the relations of sarcoplasmic reticulum and contractile proteins in Duchenne dystrophy (with Drs. Eastwood, Sorenson, and Reuben). He analyzed the abnormalities of Ca-regulation in malignant hyperthermia, and the relation of muscle cell-membrane abnormalities to clinical manifestations with Dr. Willner. He is studying the cellular basis of myotonia, with Drs. R. Lipicky and S. Bryant (University of Cincinnati).

With Drs. Reuben and Wood, and Katherine Bock, Dr. A. Eastwood studied the morphology of chemically skinned mammalian skeletal muscle fibers. In muscle from patients with Duchenne dystrophy he found structural changes that may account for the weakness of single chemically skinned dystrophic fibers. With Dr. Sorenson, Dr. Eastwood studied the morphological localization of calcium taken up by the sarcoplasmic reticulum of chemically skinned mammalian muscle. Using a Golgi silver impregnation technique to stain the transverse tubular system (T system) selectively, he studied the three-dimensional distribution of the T system in normal and diseased human muscle with stereo pair micrographs taken with our 100 kV electron microscope and the 100 kV high voltage electron microscope (HVEM) at Boulder, Colorado. Using Golgi staining and stereo pair micrographs, he studied the three-dimensional distribution of the T system in crustacean skeletal muscle with Drs. Clara Franzini-Armstrong and L. D. Peachey (University of Pennsylvania). The distribution of thick and thin filaments was studied in a crustacean muscle which shortens to an unusual degree and in which the myofilaments are uniquely arranged, in collaboration with Drs. Reuben and Wood.

Dr. Lovelace, with Drs. Brust and Devi, prepared a monograph, reviewing the institutional experience with Charcot-Marie-Tooth disease. With Dr. N. Singh, he continued studies of the value of computerized electromyography. With Drs. Singh and Shoenfeldt, he found clinical usefulness in studies of F-wave conduction in suspected nerve root disorders. With Visiting Fellow P. Bouche and M. Stark, Dr. Lovelace found impaired nerve condition in experimental diabetic neuropathy and improvement after pancreatic transplantation. Dr. N. Singh is developing the electrospinogram and cranial nerve reflex studies for diagnostic use. Drs. Bouche and Schoen-

feldt initiated a study of the neuropathy caused by a new drug widely used in Europe, perihexilene. Dr. Schoenfeldt found that abnormalities of serum creatine kinase occurred in patients with neurogenic disease as well as myopathies.

Dr. M. Olarte found no benefit from treatment of amyotrophic lateral sclerosis with transfer factor. With Drs. Shafer and Rowland, he is now conducting a double-blind trial of the immunostimulant levamisole. He has also initiated studies of the therapeutic value of plasmapheresis.

Drs. Vinayak Damle and Arthur Karlin synthesized a new affinity label for the acetylcholine receptor and identified its site of reaction as the acetylcholine binding site. Dr. Damle identified agents which block the cation conducting channel of the acetylcholine receptor and which are to be modified to form covalently reacting labels for the channel. With Dr. Karlin, Dr. Susan Hamilton showed that the chains isolated in solution in association with the acetylcholine binding site are also closely associated in native membrane and are thus truly receptor subunits. Rashad-Rudolf Kaldany reacted the receptor with covalently-reacting fluorescent probes and showed that such probes undergo changes in fluorescent properties upon receptor activation. Dr. David Wise has analyzed the shape of receptor in solution by neutron scattering techniques and the disposition of receptor in membrane by electron microscopy.

Dr. T. Rosenberry with Dr. Philip Barnett investigated the structure of the collagen-like subunits that attach acetylcholinesterase to membranes in synapses. They established the functional identity of the catalytic subunits of 11S and of 18S acetylcholinesterase.

Dr. H. W. Chang and Ernest Bock investigated conditions required for the isolation of acetylcholine receptor in a form which retains its native structure and function. They found that this could be achieved by allowing endogenous phospholipids to remain associated with the purified receptor as well as by maintaining receptor sulfhydryl groups in the unoxidized form. Dr. Chang was invited to the Max-Planck-Institute for Biochemistry in Munich, Germany, where she collaborated with Dr. Eberhard Neumann in studies of the dynamic properties of purified acetylcholine receptor protein by rapid fluorescence relaxation spectrometry.

Service

Clinical activities at the Neurological Institute, Babies Hospital and Vanderbilt Clinic may be assessed by the following data:

	1975	1976	1977	1978
Admissions				
Ward Adult	1809	1763	1143	1147
Private Adult	3184	2851	2400	2207
Pediatric Adult	—	790	717	805
Clinic Visits				
Adult	9845	9365	9920	9127
Pediatric Neurology	2357	2340	2636	2481
Private Office Visits				
Adult and	10,846	8721	11,126	10,812
Pediatric Neurology				
Deaths				
Adult	139	156	127	167
Pediatric Neurology	—	—	—	—
Autopsies				
Adult	36	37	38	42
Pediatric Neurology	—	—	—	—
EEG Examinations	7370	7200	7120	6900
EMG Patients	1702	1942	2124	1978
EMG Examinations	3312	3671	3962	3609

Harlem Hospital Center

Dr. John C. M. Brust continued as Director, and Dr. Edward B. Heaton as Assistant Director, of the Department of Neurology.

Dr. Brust published results, with Drs. Lovelace and Sarala Devi, of studies on patients with Charcot-Marie-Tooth syndrome, and completed a study of language and music dysfunction. Dr. Brust served as vice-president of the Harlem Hospital Center Medical Board. Dr. Heaton completed a study of familial cerebellar degeneration and continued work on malignant hypertension and, with Drs. Bruce Ehrenberg and Theodore A. List, on dementia. Dr. Yasoma B. Challenor published results of electrodiagnostic testing in facial palsy. Dr. Challenor served on President Carter's Committee on Employment of the Handicapped, addressed the 11th International Study Group in child neurology at Oxford, England, was appointed Program Chairman of the New York Society of Physical Medicine and Rehabilitation, and was elected to the Board of Directors of the American Association of Electromyography and Electrodiagnosis. Dr. List continued studies on phrenic nerve stimulation. Dr. Farah Navi replaced Dr. Danuta Janiszewski in the EMG Laboratory. Dr. Martin Feldman replaces Dr. Bruce Ehrenberg as Chief of the EEG Laboratory. Dr. Alfred Bannerman continued as clinic chief, and Dr. M. Richard Koenigsberger as chief of neuropediatrics.

More than 600 patients were admitted to the Neurology Service at Harlem Hospital, and more

than 2,000 were seen in consultation. The Neurology Clinic continued to staff four clinics, and more than 4,140 patients were seen in them. The EMG Laboratory did 517 examinations, and 1,330 EEG's were completed.

Changes in Staff

Professor Sidney Carter retired as United Cerebral Palsy-Dwight D. Eisenhower Professor of Neurology and Pediatrics. Professor Carter was recipient of the very first training grant in child neurology to be awarded by the National Institute of Neurological and Communicative Diseases and Stroke; in the 21 years since then, he trained 48 child neurologists, many of whom now direct programs at other institutions. Dr. Carter made contributions to epilepsy, vascular disease and many other neurological diseases of children, and is widely regarded as one of the founders of that specialty. He will continue as Professor Emeritus, working mostly at the Blythedale Hospital but with some activity at this medical center. In his honor, the Department established a Sidney Carter Chair in Neurology. Dr. Darryl C. Devivo of Washington University (St. Louis) was appointed Director of the Division of Child Neurology to succeed Dr. Carter.

Dr. Stanley Fahn was named H. Houston Merritt Professor of Neurology.

Activities

The Lucy G. Moses Prize in Clinical Neurology was awarded to Assistant Professor C. E. Pippenger for his work on the pharmacokinetics of anticonvulsant drugs. The Moses Prize in Basic Neurology was given to Armand Miranda for his work on cell culture of human muscle. The Fourth Annual Andrew Mark Lippard Memorial Lecturer was Abner Notkins of the National Institutes of Health. The G. Milton Shy Visiting Professor of Neurology was C. David Marsden of the Maudsley Hospital, London. Other visiting lecturers included Donald H. Silberberg (Pennsylvania), W. Teojaborg (Copenhagen), A. Roses (Duke), S. Fuchs (Rehovot), F. Plum (Cornell), S. Bryant (Cincinnati), I. Hausmanowa-Petrusewicz (Warsaw), H. Schmalbruch (Copenhagen), S. Schiaffino (Padova), T. Pedley (Stanford), P. Kark (UCLA), N. Geschwind (Harvard), E. Stalberg (Uppsala).

Departmental members who participated in courses at the annual meeting of the American Academy of Neurology included Drs. Carter, Chutorian, DiMauro, Fahn, Goldensohn, Johnson, Penn, Rowland, and Zimmerman.

Dr. S. DiMauro was elected to membership in the American Neurological Association. He was a

Rachford Lecturer at the University of Cincinnati and was Chairman of the session on metabolic myopathies at the IVth International Congress on Neuromuscular Diseases (Montreal). He lectured at the University of Pennsylvania, the New Jersey College of Medicine and Dartmouth Medical School. He participated in Symposia on Muscular Dystrophy and Disorders of Lipid Metabolism in Italy.

Dr. Abe Eastwood lectured at the University of British Columbia.

Dr. Stanley Fahn was appointed consultant to the Division of Neuropharmacological Drug Products, Bureau of Drugs, U.S. Food and Drug Administration. He also organized an international conference on cerebral hypoxia. Dr. Fahn lectured at Temple University; New York Medical College; The Wenner-Gren Institute (Stockholm); University of California (San Francisco); and George Washington University.

Dr. Arnold P. Gold was the A. Ashley Weech Visiting Professor at the University of Cincinnati and was Visiting Professor at the Monmouth Medical Center. He was the recipient of the Brennemann Memorial Lectureship and was given the Humanitarian Award of the Sartre Hydrocephalus Foundation. He was a lecturer at the University of Tennessee and at Colby College, and the Keynote Speaker on Learning Disabilities sponsored by the Queens County Medical Society and on a Channel 13 television series "Help Yourself."

Dr. Eli S. Goldensohn was elected Vice President of the Epilepsy Foundation of America, appointed to the Board of Directors of the American Board of Qualification in Electroencephalography, and was Chairman of the Board of Trustees of the Lennox Trust Fund. He was an invited guest at the 9th International Congress of the League Against Epilepsy in Vancouver, Canada, was Visiting Teacher at the Baylor University School of Medicine and gave a lecture series at the annual Colby College course in epilepsy. He directed the annual course in Clinical Electroencephalography given by the American Academy of Neurology. Dr. Goldensohn was appointed to membership in the Sergievsky Center.

Dr. Stanley B. Holstein was moderator of the annual Frank Graig Memorial Conference on Muscle Disease sponsored by the Westchester County Muscular Dystrophy Association. This year the topic was Myasthenia Gravis, with Drs. L.P. Rowland, S.H. Appel, W.K. Engel and P. Dau as participants. Dr. Holstein is a member of the Executive Committee and Medical Advisory Committee of the Westchester County Muscular Dystrophy Association.

Dr. William G. Johnson was awarded an Irma T. Hirsch Career Scientist Award for his work in the

biochemical genetics of the hexosaminidase deficiency diseases. He was an invited lecturer at the Symposium on Dominant Neurological Diseases at the National Institutes of Health.

Dr. Arthur Karlin was appointed to the Editorial Board of *Molecular Pharmacology* and was a plenary lecturer at the annual meeting of the American Society of Biological Chemists.

Dr. George Katz lectured at the University of Vermont and Dr. M. Kawai lectured at a Gordon Conference on Muscle Mechanics in a Symposium in Tokyo.

Dr. L. T. Kremzner and Dr. Coté were invited to give a paper at the Second International Symposium on Huntington's Disease.

Dr. Linda D. Lewis spent 6 months as Visiting Professor at the medical school in Shiraz, Iran.

Dr. R.E. Lovelace lectured at Temple University and the Albert Einstein College of Medicine.

Dr. N.L. Low was awarded the Purkyne Medal of the Czechoslovak Medical Society. He was President of the International Child Neurology Association and Associate Editor for the multivolume *Practice of Pediatrics*. He lectured at Oxford, England, and in Prague, Czechoslovakia.

Professor Emeritus Richard L. Masland gave the William Lenox Lecture of The American Epilepsy Society. He served on the Boards of that society, the Orton Society, the National Multiple Sclerosis Society, and the Myasthenia Gravis Foundation.

Dr. James R. Miller was appointed to the Advisory Board of the University Center for the Study of Human Rights.

Dr. Marcelo Olarte was awarded the Ezzard Charles Fellowship of the Muscular Dystrophy Association. He lectured at the Bergen Pines Hospital, Flushing Hospital, Jamaica Hospital and the New York Infirmary.

Dr. C.E. Pippenger was senior editor of a book, *Antiepileptic Drugs: Quantitative Analysis and Interpretation*, in conjunction with Drs. J.K. Penry and H. Kutt. Dr. Pippenger was selected as Editor-in-Chief of a new quarterly journal, *Therapeutic Drug Monitoring*.

David Nachmansohn, Professor Emeritus of Biochemistry and Special Lecturer of Biochemistry, has written a historical book about science in Germany during the first three decades of this century. The book is entitled: *German-Jewish Pioneers in Science-1900-1933: Highlights in Atom Physics, Chemistry and Biochemistry; Destruction by Hitler*

and World Wide Repercussions". Dr. Nachmansohn participated in the Aharon Katzir-Katchalsky Memorial in Goettingen and became Doctor of Science at the University of Liege, Belgium, and at Tufts University, Boston. He was also made Honorary Fellow of the Berlin Medical Society.

Dr. Terrone L. Rosenberry was invited to join the Editorial Board of the *Journal of Biological Chemistry*.

Dr. Lewis P. Rowland was elected an Honorary Member of the Polish Neurological Society. He was a Vice-President of the IVth International Congress on Neuromuscular Diseases (Montreal) and President of the Association of University Professors of Neurology. He participated in Symposia on Muscular Dystrophy and on Lipid Disorders in Italy and he lectured at MDA symposia in Tuscon and White Plains.

Dr. R. Schoenfeldt served as medical advisor to the New York City Chapter of the Muscular Dystrophy Association.

Dr. Joseph Willner lectured at the National Institutes of Health. Dr. Donald S. Wood was invited to a workshop on Malignant Hyperthermia at the University of Texas, Galveston, and lectured at the Medical College of Wisconsin.

Dr. Earl A. Zimmerman lectured at Mount Sinai Medical Center, the Neurological Institute of Montreal, the Emory University Post Graduate Course on Pituitary Tumors and the Lennox Hill Hospital Post-Graduate Course in Endocrinology.

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School of Nursing

HELEN F. PETTIT,
Associate Dean (Nursing)

Programs

The School of Nursing is the first to have offered a program in advanced clinical practice leading to a Master's degree. The Trustees approved this degree in 1946. In 1977-78 a major expansion of this offering was implemented.

All graduate tracks are now four terms in length. Each requires 55 credits, of which 26 are in the major, 17 in core courses, and 12 in electives. There are six tracks or "majors": Psychiatric—Community Mental Health, Adult or Child, Dr. Ann Earle, Director; Maternity Nursing—Nurse Midwifery, Joyce Beebe, Director; Perinatal Intensive Care—Dr. Eunice Messler, Director; Adult Health (primary care)—Dr. Geraldine Lynch, Director; Pediatric Ambulatory Care—Dolores Jackson, Director. Each prepares the clinical nurse specialist or nurse practitioner.

This expansion is appropriate if the School is to make its expected contribution to the University for leadership in health care practice, education, and research. A program leading to a doctoral degree is envisioned, and Dr. Ann Earle has accepted the chairmanship of a committee to make recommendations in this regard.

The period of evaluation for the undergraduate program continues. Reports from graduates and their employers suggest that the program has met many of its objectives. Most importantly, the graduates are nursing ably in positions that they found easily and which they enjoy.

Development of new teaching strategies has been

of interest to many faculty. Methods and audiovisual materials for clinical teaching are being tested.

Three programs in continuing education were offered during the year. These were coordinated by Bonita Schulze. A program, "Orthopedic Trauma," was offered jointly by the School of Nursing and The New York Orthopedic Hospital. It was chaired by David Andrews, M.D., Associate Professor of Clinical Orthopedic Surgery, College of Physicians and Surgeons, and by Laurie Verdisco, R.N., M.A., Assistant Professor of Nursing and Coordinator of the area of Medical-Surgical Nursing.

A second program, "Patterns of Parenting," was planned by the nursing staff of the Babies Hospital and the Continuing Education Committee of the School of Nursing. T. Berry Brazelton, M.D., Associate Professor of Pediatrics at the Harvard Medical School and author of "Infants and Mothers and Toddlers and Parents," was the keynote speaker. Welcoming and introductory remarks were presented by Jane McConville, R.N., M.A., Associate Director of Nursing, Babies Hospital, and by Michael Katz, M.D., Chairman, Department of Pediatrics, and Director of Pediatric Service, Babies Hospital. Bonita Schulze, R.N., M.A., Associate in Nursing, was moderator. The discussion and evaluation sessions centered around Tentative Patterns of Parenting.

The third program of the year was offered by the School and Neurological Institute. "Management of the Patient With Stroke" was coordinated by Aurora Villafuerte, R.M., M.Ed., Assistant Professor of

Nursing. Participants included nursing faculty; Laura Merker, R.N., Ph.D., Associate Director of Nursing of the Institute; members of the nursing staff; Gary M. Abrams, M.D., Chief Resident in Neurology; Jim Kruse, R.P.T., Supervisor, Physical Therapy Department; Lauralee Hawkins, O.T.R., Supervisor, Occupational Therapy of the Neurological Institute; and Alice Banks, L.S.P., Department of Speech and Hearing, Presbyterian Hospital.

Average attendance at these programs was approximately 100. Nurses came from institutions and agencies in the tri-state area and from greater distances, primarily from community hospitals.

Three faculty participated in continuing education programs for staff nurses within the Western and Upper Manhattan Perinatal Network by giving lectures or staff conferences: Marjorie Bredice, M.A., R.N.; Jeanette Coleman, R.N., M.Ed.; and Eunice Messler, Ed.D., R.N. Topics were "Fetal Monitoring Pattern Interpretation" and "Medical Complications During Pregnancy."

Through the efforts of Beverly Fineman and Linda Russo, a second group of Icelandic nurses carried a three-week program examining teaching and practice techniques in this country.

Recruitment and Admissions

Efforts to make known the various offerings and to assist the Admissions Committee in the selection of students were major undertakings for the admissions staff: Elin Ozdemir, Director, and her assistant, Rebecca Lindsey. Announcements of new tracks and other data were prepared, and over 235 colleges and schools were visited.

Field Practice

As graduate tracks expanded and increased in number, selection of field practice sites was a major faculty undertaking. The cooperation of agency staffs and the sense of need for these practitioners made the task interesting and satisfying.

The Student Health Service on the Health Sciences Campus offered experiences to students in the Adult Health track, with Dr. Thomas Q. Morris and Geraldine Lynch, R.N., Ed.D., as preceptors. The general medical and walk-in clinics of Vanderbilt Clinic gave practice opportunities under the preceptorships of Dr. Michael Stewart and his staff and Linda Habif, R.N., M.A. The Court Employment Project was developed as a teaching site by nurse faculty practicing in the setting. This started a health service for this community-based multidisciplinary rehabilitation program, which involves clients from the criminal justice system.

The Neonatal Intensive Care track worked with the

nursing and medical staff at the Medical Center to develop protocols and preceptor relationships in the Neonatal Intensive Care Unit of the Babies Hospital and the nurseries of Sloane Hospital. Drs. L. Stanley James and James Driscoll worked closely with the faculty in this endeavor.

This year saw the first expansion in course credits and length of program for the track in Maternity Nursing—Nurse Midwifery since its inception in 1955. New clinical sites developed were at the St. Luke's Woman's Hospital and North Central Bronx Hospital. The Midwifery Service at the St. Luke's Hospital Center was beginning, and the willingness of Mrs. Ruth Hill, Associate Vice President and Director of Nursing Service, and her staff to cooperate with the faculty was greatly appreciated. Of special note is the fact that Joyce Beebe, R.N., C.N.M., and Ann Wittenborn, R.N., C.N.M., were appointed to the Nurse-Midwifery staff at St. Luke's in a dual faculty-service appointment.

This faculty is experimenting with teaching strategies to permit monitoring and input by faculty on an ongoing basis for use with experiences offered at fairly distant sites. The pilot efforts are in usual settings; however, the effort is seen as perhaps leading to exceptional experiences for particular students.

Mrs. Mary Hill, R.N., M.A., organized the second annual Faculty-Agency Personnel Forum in the Hammer Health Sciences Center. Helen Pettit, Associate Dean, and Ruth Hill, Associate Vice President and Director of Nursing Service at St. Luke's Hospital Center, addressed the group of about one hundred. Closer working relationships in education, including continuing education, practice, and research were discussed, and major interest was shown.

Multimedia

"Assessment of the Newborn," a video cassette developed by Marjorie Bredice, R.N., M.A., of the Maternal Child Health faculty, and a former faculty member, Patricia Beaulieu, R.N., M.A., was awarded honorable mention in the multi media contest of the American Journal of Nursing.

The Nursing Media Consortium continues to share ideas and to coordinate activities among baccalaureate and higher degree programs in the area. Sharing evaluations of existing audiovisual material and strategies in their use has been helpful.

Degrees Conferred

Baccalaureate: 162; Master's: 35. The number of Master's degrees conferred was fewer than in previous years because of the adjustment of programs from one year to two.

Awards

The following awards were made during the year on the recommendation of the Awards Committee, chaired by Lucy Warren. In the Fall, the Rose Driscoll Award was presented to Cassia W. Jevremo and the Catherine Chesney Award to Jean Scandlyn. At Commencement in May, the Arlene Myers Award was given to Lynnea M. Carstens and Janice Green, the Margaret Eliot Prize to Judith Fitzwater, and the Jackson Prize to Lyn Seaborne and Janice Knorr. The Alpha Zeta Chapter of Sigma Theta Tau awards were made to Gino Romeo and Anthony Santangelo.

A new prize was donated anonymously in recognition of a nurse who is making a major contribution to the care of people. Named the Sister Joseph Ignatius Prize, it was awarded to Susan Rockwood for combining sound knowledge with compassion and technical competence in the care of the orthopedic patient.

Student Activities

Barbara Coleman joined the staff as Assistant Director of Student Affairs. Her contributions have been most helpful.

Housing served to foster many interests and activities for students on the Health Sciences Campus. During the Fall, residence in Maxwell Hall was opened to students from all health disciplines on this campus. This is surely a step in the right direction.

A contribution of about \$4,000 was made to the School's fund-raising efforts by a student-faculty bazaar. The event was more than a financial success, and recognizing all who made it so would be impossible. The many people from the University and Hospital who attended and bought chances gave the undertaking a fine feeling.

The undergraduate students on the Morningside Campus held a student "convention" in Atlantic City. It was planned and implemented by students from many schools of the University and seemed to provide all with a better sense of community.

Graduation was organized by a tripartite student, faculty, administration committee, which included representatives from both graduate and undergraduate students. P&S Dean Donald Tapley's greetings and congratulations added a great deal to the ceremony. The address was given by Penelope Buschman, R.N., M.A., a faculty member in the Child Liaison track of the Psychiatric—Community Mental Health major and clinical specialist in this field in the Babies Hospital.

Faculty Participation with University and Affiliated Groups

Over the year, ten students from Teachers College

enrolled in the functional major of curriculum and teaching had field experience under members of the nursing faculty: in Community Health with Charmaine Fitzig, in Advanced Nursing in Pediatrics under Lucy Warren, in Medical-Surgical Nursing with Mary Hill, Elizabeth Mahoney, and Aurora Villafuerte.

Elsa Poslusny presented a paper, "Living with Dying," at Teachers College.

Ann Earle and Lucie Kelly served on the Nursing Task Force reviewing nursing practice at Psychiatric Institute. Dr. Earle has been reappointed to the position of Assistant to the Director of Psychiatric Institute for Nursing Service and Education.

Sigma Theta Tau Alpha Zeta Chapter

In September the Chapter presented its second annual conference on Translating Research into Practice; the topic was "Body Image." This was one of four programs offered over the year.

Alumni Relations

Meetings were held with seven alumni groups in the Southeast: four in Florida, one in Georgia, and two in North Carolina. The groups were very much interested in the School and in the faculty's beliefs about the future of nursing.

All alumni have been solicited in connection with Medi/Center I fund-raising efforts, and their response has been most encouraging. A program of annual giving is being organized.

The Association's award for alumni who have made outstanding contributions to the Association, School, or the profession at large was presented to Margaret Wells, '29, for her untiring efforts in behalf of alumni and the Association; and to June Travers Werner, '45, Chairperson, Department of Nursing Education, Evanston Hospital, in Illinois, a member of the McGraw Medical Center of Northwestern University. Her citation spoke to her foresight and innovation, a pioneer in primary care, projecting a highly personalized system of nursing care for the patient.

Margaret E. Conrad, '20, was presented the Columbia University Alumni Medal (through the Alumni Federation) by President McGill. The citation recognized her active and loyal support of the Alumni Association and her leadership in organizing the alumni group in Connecticut.

More than \$10,000 was given to the School by the Association for student scholarships. These are sorely needed, and the School's gratefulness has been expressed by it, the President, and Dean Tapley.

A close relationship between the alumni and the School is vital.

Friends of the School of Nursing

Fund-raising activities to support scholarships for nursing students have had the support of friends, alumni, and parents over a twenty-year period. Contributions raised through the annual Benefit Bridge Party added \$17,000 to the School's scholarship funds last year. Our gratitude cannot be expressed too often, and is expressed most particularly to the present chairman, Mrs. George Barson. Through this effort, the Woman's Auxiliary of the Presbyterian Hospital has given generously to the nursing scholarships. We feel privileged to be included among their priorities.

Community and Organizational Activities

Most faculty made a major contribution to one or more community organizations during the year through papers, programs of continuing education, or direct practice: *Nancy Kulb*, R.N., M.S., C.N.M., served as chairman of the National Program Committee for the American College of Nurse-Midwives. *Eura Lennon*, R.N., M.A., was elected to the Executive Board of the Black Nurses Association. *Elizabeth Carter*, R.N., M.S., moderated a panel on "Chronicity, Illness, and Lifestyle" at the meeting

of the American Psychiatric Association in San Francisco in October 1977. *Linda Russo*, R.N., M.A., presented two papers on "Helping Health Professionals Cope with Life-Threatening Illnesses" and "Children, Death, and Nursing Intervention" for the Pediatric Nursing Department of Mount Sinai Hospital, New York City. *Charmaine Fitzig*, R.N., M.S., worked with the central committee planning the Health Fair under the National Broadcasting Company and coordinated the School's contribution, faculty and students. *Joyce Beebe*, R.N., M.P.H., C.N.M., served as a Maternal Child Health Education and Evaluation Consultant in four African countries under the sponsorship of USAID. Her visit covered a one-month period.

Seven members of the faculty attended the annual national convention of the American Nurses Association in Hawaii. The School maintained a booth depicting programs and opportunities it has to offer to attract students and faculty.

Alumnae in Hawaii, as well as other alumnae and former faculty attending the convention, joined School faculty at a brunch. Anne Kellett was hostess for the event.

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Nursing Service

MARY I. CRAWFORD

Vice President, Nursing

In January and February, the Associate Directors and Vice-President of Nursing spent three days at a workshop in Hastings-on-Hudson developing management objectives for the next five years. These objectives include the development and use of a process audit form to measure the use of the patient care plans, condition of the chart, attitude of the patient/parent toward care, condition of the unit, safety, patient/parent knowledge, nursing history and documentation of teaching. Deadlines were set for completing these objectives. The remainder of the year was used in applying these objectives to the individual care units and assisting them in developing their own objectives.

In March the Hospital Administration, in keeping with utilization patterns, reduced the total bed capacity by 200 beds. Two floors were closed; Pediatric Orthopedics—Babies Hospital 5th floor and Adult Surgery—Presbyterian Hospital 12th floor. All nursing employees on these floors were relocated. On July 1st, PH 10 West was transferred from the Surgical Service to the Medical Service. Again all staff members were reassigned predominantly in the area of their choice.

On October 1, 1977 a contractual arrangement with Englewood Hospital and Valley Hospital went into effect requiring that we accept admission and transfer of all of their ill neonates. With the absorption of Babies Hospital 5 Orthopedic Service and the increase in the Neonatal Service, the overall occupancy of Babies Hospital for April through August increased from 75.6% to 85.2%.

The Indirect Patient Care Services have been reorganized in order to provide a Ward Manager for supervision on the evening shift. The old PH 12 tray room has been converted to a centralized tray room providing service for PH 4, 8, 9, 10, 11 and 14. Baseline data on current year costs are being collected and a separate cost center has been established for the central tray room. This tray room is now open from 8 a.m. to 8 p.m., Monday through Friday.

A tool for monitoring conditions of nursing units and safety conditions is being developed by the Ward Managers. This tool measures the overall working rate frequencies. The closing of 10 West and the 12th floor has increased the occupancy in Surgery by between 13% and 14%, drastically increasing the workload of the nursing staff. The PH 14 Recovery Room has also been affected by the change in the operating room time available with the result that a greater portion of the patients are in the Recovery Room after 4 p.m. and on Saturdays. To make the expansion of operating room time possible, several additional staff nurses and one nursing aide were employed in the operating room. This change has resulted in better care for the patients, as less fracture and open heart cases are treated on evenings and nights as emergencies. Performance evaluations have been developed for staff nurses, head nurses and supervisors in the operating rooms. Self-teaching modules have been developed by the staff in four different operating areas.

Patient discharge instruction sheets have been introduced in Surgery, Babies Hospital, PH 4, PH

5, three units in Neuro and five units in Harkness Pavilion. Grand rounds were begun with 50 nurses attending in March and 70 in May. A new orientation program for head nurses has been developed using performance contracts, self-learning activities with preceptor coaching and performance feedback. Workshops on management by objectives for leadership staff were held with attendance of 156. On 4 East a nine-lecture series entitled "Chemotherapy Drugs and their Administration" was coordinated by the Senior Supervisor, Marion Smith. Printed materials were developed and checklists continue to be an integral part of the teaching procedure.

Babies Hospital has introduced self-teaching modules for hyperalimentation and blood administration via the Harvard pump.

Sibling visiting for the patients on Harkness 8 from 6 to 8 p.m. daily has been introduced in Sloane. The maternity service is also now administering silver nitrate drops to the newborn in the Newborn Nursery rather than the delivery room. This allows for a better maternal-infant bonding period immediately following delivery. Four hundred-thirty-three patients have attended Preparation for Childbearing classes in 1978. The demand for classes is still greater than the number of classes the service is able to offer with present staff. Ms. Barbara Luke has also inaugurated a Womens, Infants and Children (WIC) program at Sloane Hospital.

An EKG interpretation course was developed and offered by the Vanderbilt Clinic nursing instructor enabling the institution to maintain its qualifications as an emergency heart saver station. In coordination with the three other regional hospitals in upper Manhattan, the Vanderbilt Clinic nursing staff has been working to develop comprehensive standards for a city-wide EMSS program.

Carol Camunas, Senior Supervisor on PH 4, planned and coordinated the 77 Regional Workshop of the National Association of Research Nurses and Dieticians at the Hotel Americana on November 3-4, 1978. Three staff nurses, B. Butler, M. Doyle and R. Rayner, presented a conference entitled "Developing a Nursing Research Protocol".

Mrs. Smith and Miss Butler have developed a research project studying the effectiveness of nurse-administered chemotherapy. Data collection should be completed this year.

The staff has also developed a questionnaire to assess pain relief and several patients have been surveyed to date. There is interest in developing and evaluating a program that will enable us to provide more effective pain control. Several conferences on pain were attended and the ideas implemented in patient care. Both PH 4 West and PH 4 East are

organized on a primary nursing care model.

The transplant staff has been working on a project to facilitate teaching medications to patients who have limited comprehension using color coding systems.

Miss R. Rayner has chaired a committee of the Medical Center investigating job satisfaction among PH staff nurses. This committee is presently collecting data and hopes to publish the results this winter.

Additional research completed or continuing includes a project entitled "The Long Term Effects of an Inpatient Cardiac Rehabilitation Program on Cardiac Function, Compliance and Mood" being conducted by Dr. Carolyn McCagg with Sara Wells. Two research projects have been completed by Ms. Barbara Luke, "Study of Gestational Diabetics to Evaluate the Effect of Maternal Weight Gain and Other Factors on Infant Growth and Development" and "Study of Influence of Obesity in the Outcomes of Pregnancy." She is now working on a study on pica patients.

In September 1977 the Practical Nursing Program admitted 72 students. Of this number 45 were graduated on July 28, 1978. The Associate Degree Program admitted 39 students and graduated 37. One hundred percent of both the Practical Nurse graduates and the Associate Degree graduates passed state boards last year, and the average mean was above the average for the state mean in similar programs.

Members of the nursing staff participated in the following outside activities:

1. Lectures to a senior citizens group of the Inwood section of Manhattan—A. Miller, M. Moran, J. Livelle, M.E. Willie, P. McGorey, all from Vanderbilt Clinic.

2. Planned and coordinated the 77th Regional Workshop of the National Association of Research Nurses and Dieticians—Hotel Americana, November 3-4, 1978—Carol Camunas

3. Site visitor for Nassau-Suffolk Health Systems Agency for evaluation of perinatal care—J. McConville

4. "You the Black Women"—Channel 7—Millie Abbott

5. "Not for Women Only"—Channel 4—Millie Abbott

(Both the above programs were also broadcasted over radio WNBC and WBSL in New York.)

6. Planned and participated in in-service programs for Community Outreach Workers to learn how to identify pregnant women who are at risk and are not receiving prenatal care—Millie Abbott

7. Special Consultant on Nutrition to the State Education Department in Albany for the External Degree Program in Nursing—Barbara Luke

8. Testified before the Senate subcommittee on Alcohol and Drug Abuse in Washington, D.C. on fetal alcohol syndrome—B. Luke

9. Series of radio shows for the Harvard School of Public Health on Maternal Nutrition and Fetal Alcohol Syndrome—B. Luke

Awards this year include the Certificate as Clinical Specialist—Psychiatric Mental Health Nursing, American Nurses Association, Division of Psychiatric and Mental Health Nursing Practice—Penny Buschman; Joann Lamb qualified as instructor for basic life support training according to the standards of the American Heart Association and Regional Emergency Services Council of New York City. Ms. Lamb has initiated the first course for training in basic life support services at Presbyterian Hospital.

New appointments include:

1. Patricia Richter—Instructor, Staff Development—July 24, 1978

2. Ellen Martin—Instructor, Orientation Unit—March 1978

3. Nancy Boccuzzi—Senior Supervisor Neonatal Intensive Care Unit—October 1977

4. Sandra Byrd—Associate Director of Nursing—March 16, 1978

5. Margaret Willers—Business Manager—February 21, 1978

6. Helen Henry—Senior Associate Director for Personnel and Staffing—March 1, 1978.

Mrs. Margaret Reilly, Head Nurse in Cystoscopy for 42 years, retired this year. Miss Mary Windrow, Director of Nursing Service retired this year after 38 years of service to nursing at Presbyterian Hospital.

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Obstetrics And Gynecology

RAYMOND L. VANDE WIELE

Rapaport Professor and Chairman of the Department • Director of Service

1978 has been a year of significant progress for the Department of Obstetrics and Gynecology, with important developments occurring in both the clinical and research areas. In the clinical area, the most significant development has been the success of our effort to organize a perinatal network covering western and upper Manhattan. This effort, still the only successful one in the metropolitan area, has already resulted in important improvements in perinatal care in the area. The Western and Upper Manhattan Regional Perinatal Network includes the Obstetrical Services of the Presbyterian, Roosevelt, Harlem, St. Luke's and St. Vincent's Hospitals. The success of the Regional Perinatal Network has led to requests to expand it to include hospitals in New Jersey, Rockland County, and Westchester County. The contraction of public, mainly Federal, funds for research has had only a minor impact upon the research activities of our Department and, in fact, in several areas, the research support available to our investigators has increased rather than decreased.

The Center for Reproductive Sciences

This Center, functioning under the direction of Dr. Georgiana Jagiello, incorporates an interdisciplinary group of members from various Departments in the College of Physicians and Surgeons. They concentrate their efforts on the physiological and biochemical mechanisms underlying normal and abnormal human reproductive function. Besides playing an important role in research, the Center participates increasingly in the teaching of graduate and post-

graduate students at the Columbia-Presbyterian Medical Center. A recent, substantial grant from the Mellon Foundation has allowed the Center to branch into several new areas of research.

The activities of the Center can best be discussed under six headings:

Biochemistry of Reproduction

The laboratory of Dr. Seymour Lieberman is presently concerned with two important and novel facets of steroid hormone biochemistry. One involves efforts to obtain evidence that would support the hypothesis, advanced some years ago, that steroidogenic processes are catalyzed by multienzyme complexes which reside in hypothetical biosynthetic units of cells of steroid producing tissues. This manner of considering steroid-hormone biosynthesis is entirely novel in that it proposes that the enzymatic processes involved in steroid biosynthesis occur as a series of concerted reactions involving enzyme-bound intermediates which are ordinarily not released into the medium in a free state. The conventional view of steroidogenesis, on the other hand, assumes the existence of free intermediates associated with their relevant enzymes in almost a random manner. If this thesis is correct, our understanding of these processes and of the diseases that are associated with them would be substantially different from current convictions. The second major interest of this laboratory concerns the nature and function of the naturally occurring lipoidal derivatives of steroids recently discovered by Dr. Lieberman's group. The revelation of

the existence of these hitherto unsuspected non-polar derivatives of steroids again opens an entirely new area of steroid biochemistry. These lipoidal derivatives of steroids have been shown to be present in adrenals, testes, corpora lutea and placenta. The enormously high concentration of these lipoidal derivatives in corpora lutea is of great interest but their biochemical or physiological significance remains, at present, completely unknown.

Research efforts of the laboratory of Dr. Daniel Linkie continued to be focused on the mechanism of estrogen action with particular emphasis on the early events of hormone-receptor interaction.

The laboratory of Dr. Richard B. Hochberg has been moved to Roosevelt Hospital. The interests of this laboratory include the elucidation of the structure and biochemical significance of a newly discovered metabolite of estradiol, the structure and biochemistry of an unknown estrogen that circulates in enormous concentrations in the plasma of the juvenile rat, and the synthesis of a radioiodine labelled steroid for use in steroid receptor studies and *in vivo* radioimaging of tumors that are under endocrine control.

The laboratory of Dr. Muriel Feigelson, also located at the Roosevelt Hospital, has been primarily devoted to studies on the endocrine mechanisms regulating mammalian peri- and postnatal development. Drs. E.G. Armstrong and Feigelson have been exploring the mechanisms underlying the hormonal regulation of a model enzyme, hepatic histidase. Dr. Feigelson, in collaboration with Dr. Linkie, has been exploring perinatal developmental events associated with the maturation of tonic gonadotrophin secretion. They have made the important observation that pharmacologic doses of aromatizable or non-aromatizable androgens, administered to male rats during the first three neonatal days, induce profound suppression of testicular growth and development of spermiogenesis, androgen secretion and fertility during subsequent maturation. These observations suggest that in the male, as in the female, the differentiation of the endocrine hypothalamus is critically dependent upon the effect of gonadal hormones.

Neuroendocrinology of Reproduction

The neuroendocrine group composed of Drs. J.L. Antunes, and P. Carmel, (Neurosurgery); M. Ferin, (OB/GYN and Physiology); E. Zimmerman, (Neurology), has continued its research on neuroendocrinological control of pituitary secretion and of reproduction. Most of the studies were done in rhesus monkeys and had the following research objectives: 1) a study of the brain areas and neural pathways involved with anterior pituitary secretion and

menstrual cyclicity, using lesioning/electrochemical stimulation techniques, with emphasis on hypothalamic and limbic structures, (with Drs. P. Cogen and K. Louis); 2) a study of hypophyseal portal blood circulation and of endocrine modulation of neurohormonal release into portal blood, using neurosurgical techniques for portal blood collection; these procedures have also been modified to collect pituitary sinusoidal blood during transphenoidal operations in patients with pituitary tumors; 3) a study on the direct effects of estrogens on LH and prolactin secretion and the modulatory effects of the steroid on pituitary secretory response to neuroleptic drugs (with P. Diefenbach, A. Dennison and Dr. A. Frantz from the Department of Medicine); 4) a study on the long term endocrine and morphological effects of pituitary stalk section, using radioimmunoassay, bioassay and immunocytochemical techniques (with Dr. I. Dyrenfurth); 5) a study of oxytocin and LHRH pathways (with Dr. A. Silverman, Anatomy); a striking observation in this study was the finding of oxytocin pathways which originate in the hypothalamus and project to distant sites, such as the spinal cord. The possibility that these pathways may play a role in autonomic and pain regulation are currently being investigated.

Dr. Dominique Toran-Allerand is continuing her studies on the organizational role of the gonadal steroid hormones on the development of the mammalian brain, using long-term organotypic cultures of the perinatal rodent central nervous system. In collaboration with Drs. Bruce McEwen (Rockefeller University) and Neil MacLusky (Yale University), Dr. Toran-Allerand is studying estradiol and testosterone receptors and their metabolism, autoradiographic localization of the steroids and steroidal effects on protein synthesis. In collaboration with Dr. J. Brawer (McGill University), she is studying electron microscopic correlates of the steroidal effects on the cultures and with Drs. C.S. Carter and W.T. Greenough (University of Illinois) is carrying out computer analyses of neuronal differentiation in the culture.

Female Reproductive Endocrinology

Drs. R. Jewelewicz, N. Husami and F. Biffignandi continued their studies of the response of estrogen-stimulated neurophysins (ESN) in patients with various menstrual abnormalities, early pregnancy, and patients with hypothalamic and pituitary disease.

Drs. Jewelewicz, Zimmerman and Vande Wiele continue a study on the effects of bromocriptin in patients with amenorrhea and galactorrhea and ex-

panded their studies on the effect of pregnancy in patients with pituitary tumors.

Male Reproductive Endocrinology

Dr. Wylie Hembree's laboratory has continued its studies of testicular function in human marihuana smokers and demonstrated a clear decrease in sperm production, motility and morphology following high-dose, in-hospital marihuana exposure. Biochemical studies of sperm function in marihuana smokers and men with male reproductive dysfunction (with Dr. Georgiana Jagiello) have revealed specific defects in the utilization of energy sources for motility production. Finally, changes in spermatogenesis in the marihuana treated and Vitamin A deficient rat (with Dr. Hosea Huang) is being used as a model system for the abnormalities observed in humans.

Dr. Hembree has continued his studies with Dr. Richard Ehrenkauf on the tritium labeling of peptides and protein hormones studying the metabolism of GnRH in the rat.

Dr. H. Calvin, in collaboration with Drs. Salgo and Wallace, has continued his work on trace elements and spermatogenesis. The major zinc-binding protein in the rat sperm tail has been isolated and shown to consist of a pair of polypeptides. Preliminary studies on the effects of zinc-deficiency upon spermatogenesis indicates that, in addition to its well-known suppressive effect upon sperm production, this condition leads to reduced sperm motility and tail defects. These secondary effects however, occur only in coincidence with severe oligospermia. By contrast, Dr. Wallace has found that Selenium-deficiency in the mouse leads to sperm tail defects in the absence of noticeable suppression of spermatogenesis.

In collaboration with Dr. Jagiello, Dr. Calvin has continued his work on bovine granulosa cell proteins.

Genetics of Reproduction

The research in the laboratory of Dr. Jagiello is focused on endocrine control of mammalian meiosis. Five essential signals of the meiotic process are being examined. (1) The role of X chromosome activity, the *rete ovarii* and gonadal/pituitary hormones on meiotic commencement (using cytologic, immunochemical and biochemical methods.) (2) The condensation/decondensation cycle of diplotene inhibition. (3) The interaction of gonadotrophins and serine proteases in the resumption of meiosis during the periovulatory period. (4) A putative inhibitory action of luteinizing hormones on meiotic progression, and (5) the meiotic spindle apparatus during fetal and adult oogenesis. Additional research fo-

cuses on detailed analyses of four critical components of mammalian meiosis: Cycle times; pachytene structure and pairing; sexual dimorphisms of diplotene and the synaptonemal complex.

Ultrastructural Studies of Reproductive Tissues

Funds obtained from the NIH have made it possible to develop an electron microscopy unit that will serve as a core unit for all members of the Center for Reproductive Sciences. This core consists of an integrated unit comprising a preparative electron microscopy unit, two electron microscopes and a completely equipped dark room. A JEOL scanning electron and a 100cx transmission electron microscope are now in full operation. The unit is supervised by Dr. Cecelia Fenoglio and the day-to-day work is done by Mr. James Dennis, in collaboration with individual investigators.

Maternal and Child Health

As in previous years, the Perinatal Division, under the direction of Dr. Stanley James, has continued to coordinate the perinatal activities of the Department of Obstetrics and Gynecology, of Pediatrics, and of Anesthesiology. It is likely that the important strides that have been made toward decreasing the perinatal mortality to an irreducible minimum are more the result of this close coordination than of technological advances. This year there was no significant change in the perinatal mortality rate at the Presbyterian Hospital mainly due to the increased influx of high-risk patients from other hospitals in the Regional Perinatal Network.

An important technological advance appears to be the availability of newly developed PO₂ electrode allowing continuous transcutaneous measurements of fetal PO₂. Progress with the use of this instrument has however been slow, mainly due to methodological problems, but it appears that earlier difficulties with the electrode application and stability of the recording are now being solved satisfactorily. The computer section of the Division of Perinatology (Mr. H. Rey) has made important progress towards the development of on-line computer system that will provide the clinician with instantaneous real time analysis of the condition of the patient in labor thus allowing earlier and more accurate detection of possible abnormalities. Algorithms have been developed which make it possible at any one time to assign a precise risk score to the patient in labor.

Dr. James and Dr. M. Yeh have continued their work on cardiovascular responses of the fetus to partial occlusion of the umbilical vein. These studies are essential for a better understanding of the changes

observed in electronic monitoring of fetal heart rate. In the well oxygenated fetus, partial occlusion of the cord resulted in hypotension and transient acceleration of heart rate. This response could be abolished by pharmacologic blockade of the sympathetic nervous system with dibenzylamine or propranolol. In the hypoxic fetus, on the other hand, partial occlusion of the cord resulted in hypotension with or without deceleration of the heart rate. These findings in the experimental animal provide alternate explanations for both early and late decelerations of the fetal heart rate observed in the human fetus. In the light of these observations, it is clear that the rigid adherence to the current classification can lead to both misinterpretation and erroneous clinical decision. Further progress in ante and intrapartum monitoring requires a better understanding of the controlling mechanisms of fetal heart rate.

Dr. Petrie and collaborators have continued their studies of the relation of drugs administered during labor to changes in fetal heart rate. Drs. R. Stark, K. Hussain and Vande Wiele are studying the factors controlling the levels of vasopressin, neurophysin and prolactin in amniotic fluid and in the umbilical vessels. The possibility is being explored that these substances may be used as markers of fetal distress.

Dr. Freda with Dr. Gorman is exploring the possibility of reducing the Rh titer in patients with severe forms of Rh sensitization by administering massive doses of Rh antibody at the time of delivery.

Dr. Blumenthal (Pediatrics) together with Drs. E. Bowe and S. Chao have shown that fluorescence polarization of amniotic fluid can be used as an index of fetal lung maturity. This method appears to be as valuable as the determination of the L/S ratio and is much easier to carry out.

Members from the Section of Obstetrical Anesthesia and Perinatal Pharmacology have continued their studies on the effects of anesthesia upon fetal outcome. Dr. H. Morishima with Drs. M. Finster, Hilda Pedersen and Benjamin G. Covino of Astra Research Laboratory have studied the toxicity of lidocaine and etidocaine in the newborn. The same team continued its investigation of the pharmacokinetics and renal excretion of local anesthetics in fetal lambs. Drs. Pedersen and Finster, in collaboration with Dr. R. Matteo, have studied the placental transfer of drugs such as d-tubocurarine and meperidine.

Using pregnant baboons and sheep as experimental models, Dr. Morishima, in collaboration with Drs. James, K. Sakuma (Visiting Fellow in Pediatrics), Samuel L. Bruce (Obstetrics and Gynecology) and James M. Perel (Psychiatry) has studied the effect of maternal apprehension and pain in the fetus. Both

stresses lead to an increase in maternal plasma catecholamine levels and a decrease in utero-placental blood flow. These changes can be prevented by administering pentobarbital or diazepam, but are aggravated by meperidine.

Dr. Ines Mandl and her associates have continued their multipronged approach to define the pathways which lead to the immature form of elastin found in newborns with respiratory distress syndromes. Experiments have been devised to determine whether the compositional and morphological deviations from the normal in fetal lamb models subjected to intra-uterine stress are due to arrested development or to cell damage caused by the hypoxic insult. With Dr. Stark and Dr. James, the effect of ACTH and cortisol injected directly into normal and/or stress fetuses was assessed. Ultrastructural examinations with Dr. Joseph M. Cerreta (Medicine) and biochemical characterization with Dr. Stephen Keller indicated differences in fiber size and in the amino acid composition of the total pulmonary connective tissue. These data are at present submitted to multivariate computer analysis. In addition, antisera to sheep lung elastin have been prepared by Mr. Tukaram Darnule and these are used to develop a more sensitive and specific assay of elastin.

Genetics

The Genetic Counseling Service has been an integral part of the Department of Obstetrics and Gynecology at Columbia-Presbyterian Medical Center since June, 1974. Included in its staff are the following: Drs. Georgiana Jagiello, O.J. Miller, William Johnson, Malca Sane and Mrs. Sylvia P. Rubin. A total of 1,222 patients have been seen for a wide spectrum of hereditary disorders. This has included 835 referrals for prenatal diagnostic amniocentesis. Fetal abnormalities were detected in 3.4 per cent of these cases. Ultrasonography is routinely used before amniocentesis and three cases of severe congenital malformations were diagnosed prenatally with ultrasonography. Alpha-fetoprotein assays are done on all amniotic fluids and one neural tube defect was detected in this manner.

Several studies in the field of Human Genetics and Development have already been discussed as part of the report of the Center for Reproductive Sciences.

The laboratory of Dr. Orlando J. Miller, in collaboration with Drs. Dorothy A. Miller, Ramana Tantravahi and Rhona Schreck (Human Genetics and Development), Dr. Bernard F. Erlanger (Microbiology) and eight other scientists from Memorial-Sloan Kettering Cancer and Yale University, have clarified the nature of the male-determining factor on the human Y-chromosome. They have shown that a spe-

cific gene, which is required for the expression of the male-specific H-Y (histo-compatibility) antigen, is usually located on the short arm of the Y chromosome. Structural rearrangements which disturb the gene appear to play a role in the production of some of the hitherto inexplicable cases of abnormal sex differentiation.

Dr. O.J. Miller, in collaboration with Drs. Vaitilingam G. Dev, Ramana Tantravahi and Dorothy A. Miller, has presented evidence from a mouse model system that the nucleolus plays an important role in the origin of centric fusion (Robertsonian) translocations, while fusion of separate nucleoli is relatively unimportant.

Obstetrical and Gynecological Pathology

The Division of Obstetrical and Gynecological Pathology is responsible for the processing and diagnosis of approximately 4300 surgical specimens per year and approximately 30,000 Pap smears.

In addition, the Division is responsible for teaching pathology to both obstetrics and gynecology residents and pathology residents for varying periods of time during their residencies. This commitment includes residents from Columbia-Presbyterian Medical Center as well as obstetrics and gynecology residents from St. Luke's Hospital, North Shore Hospital, Harlem Hospital and occasionally residents from other programs in the city who choose to spend their elective period in obstetrical and gynecological pathology.

The Division also has an active research program both within the Institution and in collaboration with other investigators in other institutions, domestic and abroad. Dr. Ralph M. Richart and Dr. R. Levine have continued their studies on the diagnosis and treatment of pre-invasive forms of cervical neoplasia. Local treatment of these lesions by cryotherapy remains a matter of controversy but it is becoming increasingly evident that in the hands of experienced colposcopists this treatment is safe and has obviously major advantages over more invasive therapy. Drs. Richart and Levine are presently evaluating the advantages of laser beam therapy over cryosurgery, and are continuing their follow-up study of women exposed to DES *in utero* to determine the longterm effects of this drug.

Drs. Richart and R.S. Neuwirth (St. Luke's Hospital Center) have continued their work on devising a simplified out-patient female sterilization technique using a transcervical approach.

Dr. C. Fenoglio, a member of the Division of Obstetrical and Gynecological Pathology has left the Division to become Director of Surgical Pathology of

the Columbia-Presbyterian Medical Center; her report is included in that of Surgical Pathology.

Neoplastic Disease

In addition to the studies carried out by the Division of Obstetrical and Gynecological Pathology, several other studies relating to neoplastic disease are being carried out.

Drs. H.C. Frick II, R. McCaffrey and G. Hyman (Medicine) are studying the effect of a combination of cis-platinum and adriamycin chemotherapy on advanced gynecological cancer that has failed to respond to the usual methods of therapy.

Dr. B. Brown and Drs. Frick and McCaffrey are setting up a computerized cancer registry for the Department of Obstetrics and Gynecology. Dr. Barron continues to use mathematical tools to gain a better understanding of the natural history of various cancers and to develop optimum strategies for screening and therapy. His activities include a study of the optimal interval between successive Papanicolaou smears for screening for cervical cancer in the individual and the aggregate, the development of a mathematical model of the natural history of endometrial cancer, evaluation of a model he has developed on the natural history of breast cancer which identifies subsets with differential risk of incidence, and finally, studies of the methods for the graphical display and analysis of multivariate data sets.

Division of Ambulatory Care

With the appointment of Dr. Allan Rosenfield as Director of the Ambulatory Care Division the outpatient activities of the Department have increased substantially over the past year. With the help of increased funding from the Department of Health, Education and Welfare, a second Young Adult evening Clinic was opened last April. This clinic has been remarkably successful. As an example, in the first year more than 2,000 adolescent visits were recorded. This has only been possible thanks to the increased participation of volunteer physicians and counselors and nurse practitioners working with the full-time program staff. As the clinical services have been increasingly known and well-accepted by the community, a growing number of requests for training and health educational activities have been received which have rapidly exceeded the capacity of our clinical staff. A Community Advisory Council composed of a broad range of professionals and community leaders has also been formed to assist in the development of these programs and to monitor their progress.

Collaborative efforts with the Departments of

Medicine and Pediatrics to develop an inter-departmental primary care program has led to the beginning of a Comprehensive Adolescent Health Care Program. Collaboration with existing programs such as the Young Parents Program for pregnant teenagers, which is ably directed by members of the Social Service and the Nurse-Midwife Service, has fostered cooperative efforts both within the Obstetrics and Gynecology Service and other departments of the medical school.

The most recent and perhaps most important development in our Ambulatory Care Services is the reorganization of the staffing of our out-patient clinics to provide improved care within the framework of the private practice group model. The primary objective of this reorganization is to provide continuous high quality patient care in a manner that insures long-term financial viability of this service. It is hoped that this also should develop the capacity to serve in the clinics a more diversified population with a one class, more personalized, dignified patient

care. A renovation of the physical facilities of the fourth floor of the Vanderbilt Clinic is a prerequisite to make it possible to meet these objectives, but the current delay of such renovation has not prevented the implementation of the initial steps in the program.

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TABLE 1
CLINIC VISITS

	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>
Obstetrical	30,190	25,952	23,195	22,119	25,488	24,362
Gynecological	12,275	10,000	9,800	9,044	9,286	8,424
Total	42,465	35,952	32,995	31,163	34,774	32,786

TABLE 2
DELIVERIES

	<u>1965-1974 Average</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>
Ward	2,615	1,589	1,433	1,789	1,657
Semi-Private	694	1,125	1,101	1,328	1,313
Private	544				
Total	3,853	2,714	2,534	3,117	2,970

TABLE 3
PERINATAL MORTALITY

	<u>1965-1974 Average</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>
Ward	20.3/M	18.4/M	14.8/M	11.2/M	8.5/M
Private and Semi-Private	21.5/M	11.6/M	13.6/M	7.5/M	15.2/M

M = per thousand viable births (more than 1,000 grams)

TABLE 4
STILLBIRTHS AND NEONATAL DEATHS

	<u>1965-1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>
Stillbirths	10.8/M	7.4/M	8.3/M	5.8/M	6.0/M
Neonatal Deaths	10.0/M	8.2/M	6.0/M	3.9/M	5.4/M
Total*	20.7/M	15.5/M	14.3/M	9.6/M	11.4/M

*Total values rounded to nearest decimal place.

TABLE 5
RELATION OF BIRTH WEIGHT TO PERINATAL MORTALITY

	<u>Total Births</u>	<u>Total Perinatal Deaths</u>	<u>1978 Per Cent Perinatal Mortality</u>
500— 999	34	24	70.6
1,000—1,499	55	14	25.5
1,500—1,999	72	2	2.8
2,000—2,499	162	7	4.3
Over 2,500	2,692	11	0.4
Total	3,015	58	1.9

TABLE 6
OPERATIVE DELIVERIES

	<u>Ward</u>	<u>Private & Semi-Private</u>	<u>Total</u>
Cesarean Sections	352 (21.2)	352 (26.8)	704 (23.7)
Primary	231 (13.9)	236 (18.0)	467 (15.7)
Repeat	121 (7.3)	116 (8.8)	237 (8.0)
Mid Forceps	58	55	113 (3.8)
Low Forceps	248	134	382 (12.9)
Breech Deliveries	29	22	51

TABLE 7
GYNECOLOGIC OPERATIONS

	<u>1965-1973</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>
Ward	696	498	451	444	585
Semi-Private	538	502	522	516	739
Private	514	627	549	669	690
Total	1748	1627	1522	1629	2014

TABLE 8
AMBULATORY UNIT
1978

<i>PROCEDURE</i>	<i>PRIVATE</i>	<i>WARD</i>	<i>TOTAL</i>
Diagnostic D&C	159	23	182
Incomplete Abortion	24	43	67
Missed Abortion	10	4	14
Inevitable Abortion	1	0	1
Threatened Abortion	1	2	3
Induced Abortion	303	496	799
Induced Abortion with Laparoscopic Tubal Ligation	12	4	16
Laparoscopic Tubal Ligation only	109	74	183
Diagnostic Laparoscopy	84	2	86
Diagnostic Hysteroscopy	1	0	1
Laparoscopy/Hysteroscopy	11	1	12
Laparotomy	2	1	3
Other	16	2	18
	<u>733</u>	<u>652</u>	<u>1385</u>

TABLE 9
CASES OF GYNECOLOGIC CANCER TREATED OR UNDER OBSERVATION
DURING EACH OF YEARS FROM 1957-1978

	<i>Total Patients Followed</i>	<i>The Presbyterian</i>		<i>Francis Delafield</i>
		<i>Ward</i>	<i>Private</i>	
1957	1,950	850	696	404
1958	1,883	853	612	418
1959	1,945	920	618	407
1960	2,248	1,084	696	468
1961	2,384	1,180	732	472
1962	2,601	1,319	801	481
1963	2,851	1,527	783	541
1964	3,198	2,752	852	594
1965	3,633	2,015	930	688
1966	3,581	2,282	850	449
1967	3,577	2,301	901	375
1968	2,396	1,281	742	373
1969	2,110	1,045	817	248
1970	2,003	966	752	285
1971	2,169	1,095	779	295
1972	1,996	966	780	250
1973	2,040	985	805	250
1974	2,042	1,013	779	250
1975	2,021	1,158	863	***
1976	1,902	1,106	796	***
1977	1,853	1,028	825	***
1978	1,870	1,004	866	***

***Francis Delafield Hospital Closed July 30, 1975
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Ophthalmology

CHARLES J. CAMPBELL

Harkness Professor and Chairman of the Department • Director of Service

Teaching

The teaching activities of the Department are varied and encompass a broad scope. Attention is directed not only to the clinical aspects of ophthalmology but to the basic science disciplines relevant to ophthalmology. There is also substantial variation in teaching techniques employed, ranging from tutorial sessions in a bedside environment to formal lectures and seminars. The students' requirements are of primary importance in fashioning the most appropriate program.

Medical student teaching (Dr. Srinivasan) consists of the major medical year and a clinical elective program. A new combined clinical and basic research elective program was initiated this year for students who have a primary interest in pursuing a career in academic ophthalmology. A purely clinical elective is offered and there is an elective in basic research (Dr. Balazs). There has been a further expansion and refinement of the Basic Science Course (Dr. Hoefle) designed to provide intensive instruction for beginning resident physicians. Postdoctoral training in specific basic sciences is available and continues to be an active program (Dr. Balazs). Fellowship training (Dr. Forbes) has been substantially strengthened and developed in the various subspecialties of clinical ophthalmology. This program involves the Columbia affiliated hospitals and integrates the clinical fellow into the Basic Research Division. The program of continuing education for practicing ophthalmologists (Dr. Farris) has been further expanded and is proving to be increasingly popular as greater emphasis is

placed on this area and recertification. Ophthalmic assistants are essential for the effective and efficient practice of clinical ophthalmology and an active training program has been developed (Ms. Moore).

Research:

The research activities of the Department involve virtually every aspect of clinical and basic ophthalmology. The basic studies are conducted in seven laboratories, and clinical research is centered in fifteen subspecialty clinics. Increasing interaction between the basic scientists and the clinicians is proving to be highly rewarding.

Ocular and orbital oncology has received attention from a number of groups. Electronmicroscopy techniques have been employed for the study of ocular tumors (Drs. T. Iwamoto, F. A. Jakobiec), including conjunctival melanomas (Drs. Jakobiec, D. Silvers). The cytological appearance and characteristics of a variety of tumors have received particular attention (Ms. A. Chattock, Dr. Jakobiec). The immunological study of ocular adnexal lymphoid tumors has been unusually rewarding (Drs. D. Knowles, Jakobiec). The clinical manifestations of an orbital apex optic nerve sheath meningioma with intracranial component has been reported (Dr. M. Behrens). A clinical pathologic report was prepared on primary malignant melanoma of the orbit (Dr. G. Howard). The characteristics of pulsating metastatic orbital tumors have been described (Drs. Howard, Iwamoto, Jakobiec, I. S. Jones, S. Trokel). There is vast clinical and laboratory experience with lacrimal gland tumors and the

surgical considerations in their management have been reviewed and summarized (Dr. Jones).

The Retinoblastoma Clinic has continued to be extremely active. An analysis of the treatment results indicates that the current mortality is in the range of 8%, a remarkable and dramatic improvement over the past forty years (Dr. R. M. Ellsworth). A technique of combined radiation and chemotherapy for orbital rhabdomyosarcomas has resulted in a satisfactory response in 71% of the patients (Drs. D.H. Abramson, Ellsworth). Newer research techniques for the detection of ocular tumors including analysis of lactate dehydrogenase and catecholamine by-products are under investigation (Dr. Abramson). These tests offer the hope of earlier and more precise diagnosis of often obtuse clinical problems. Alternatives to enucleation for the management of malignant melanoma are also being explored (Dr. Abramson). This is of particular importance in the one-eyed patient for whom enucleation would constitute total and irrevocable blindness.

A nude mouse has been developed in the laboratory to test chemotherapeutic agents. The tumor grown in the anterior chamber maintains the normal human chromosome number and appears to respond as a natural tumor to chemotherapeutic agents (Dr. Ellsworth). The total number of retinoblastoma patients is small and therefore an aid of this type will be of inestimable value in assessing the *in vivo* response of drugs.

The cornea provides the principal refraction of the eye and its optical clarity is therefore essential for good vision. To a major degree, the physiological health of the cornea is dependent on the integrity of the endothelial cells. A new scanning mirror microscope permits *in vivo* cytology and holds the promise of a quantitative evaluation of the corneal physiology and its tolerance to surgical manipulation (Drs. A. Donn, F. Hoefle, C. J. Koester). The unique qualities of this instrument provide a much larger field of view for more critical study of the integrity of the endothelial cells.

New non-invasive diagnostic techniques continue to receive wide application. Computed tomography has proven to be particularly valuable and new scanners of modern stationary detector array design are capable of resolution of millimeter structures. These are particularly suited to the study of ocular and orbital tissues. Presently, the sensitivity and specificity of these methods in patients with ocular and orbital diseases are being studied (Drs. S. Hilal, Trokel). In collaboration with Riverside Research Institute (Dr. F. L. Lizzi), the diagnostic and therapeutic modalities of ultrasound have continued under investigation. Emphasis has been placed on im-

proved diagnostic imaging and the analysis and compilation of basic ocular and orbital tissue signatures utilizing computerized methodology (Drs. D. J. Coleman, Lizzi). Studies on the therapeutic continuous wave ultrasound are also in progress and preliminary data have been obtained (Drs. Coleman, Lizzi).

A tear film is present on the surface of the cornea; it serves to provide an optical surface for high resolution vision and aids in maintaining the physiological integrity and transparency of the cornea. Hepatitis B surface antigen has been studied in surface tears (Drs. R. Darrell, G. Jacob). In collaboration with the Division of Preventive Dentistry, an investigation is underway on the levels of lactoferrin and lysozyme in tears (Dr. R. L. Farris). Tear osmolarity is proving to be a new and highly sensitive diagnostic test for keratoconjunctivitis sicca. This procedure holds great promise for more effective management of this chronic problem (Drs. Farris, J. Santamaria, III, Mr. J. Gilbard).

Extended wear contact lenses offer great hope as a safe technique for the correction of the high refractive errors of aphakia without the inconveniences associated with ordinary contact lens wear. Numerous commercial products are under clinical evaluation (Dr. Hoefle) and the use of gas permeable silicone lenses for extended wear in aphakia is being evaluated clinically (Dr. J. W. Espy). Lathe-cut hydrophilic contact lenses are also undergoing clinical investigation (Dr. Espy). Some patients who wear ocular prostheses, including contact lenses, often exhibit giant papillary conjunctivitis of the upper lids. Histologic study of biopsy specimens has demonstrated mast cells but no eosinophils; this is of importance since the conjunctivitis may be responsible for the discomfort experienced by some patients who wear these devices (Dr. B. D. Srinivasan).

Intraocular surgery and manipulation is often achieved through a corneal incision and therefore corneal wound healing is of particular importance. The factors that control the chemotaxis of polymorphonuclear leukocytes is under investigation and early studies indicate the E-type prostaglandins do not appear to be chemotactic for polymorphonuclear sites in the rabbit eye (Drs. K. Eakins, P. Kulkarni, Srinivasan).

Effective management of blinding infantile diseases often requires evaluation under anesthesia. Ketamine anesthesia is being explored for the diagnosis and postoperative evaluation of infantile glaucoma (Dr. M. Forbes). Glaucoma continues to be one of the major causes of blindness in the United States today and therefore it is appropriate that it receives particular attention. The efficacy of long term medical management of early primary angle

glaucoma is being studied (Dr. Forbes). The opacification of the lens of the eye, or cataracts, continues to be a major incapacitating disease in an aging population. Phospholine iodide is an effective local medication for the control of certain problems in glaucoma. It has been found that cataracts are increased or produced by the use of phospholine iodide over a long period of time. Using various histochemical methods, several enzymes normally present in the lens were found to be inhibited when phospholine iodide was instilled in human eyes for the treatment of glaucoma; this may very well represent the mechanism of the development of complicating cataracts when this agent is employed (Dr. A. deRoeth, Jr.).

It has long been known that the lens of the eye is sensitive to radiation and that radiation in sufficient dosage does cause cataracts. The changes at the cellular level which attend the development of radiation cataract and cataracts due to intraocular inflammation are receiving particular attention (Drs. G. R. Merriam, Jr., B. Worgul). Particular emphasis is being placed on elucidating the nature and function of the newly discovered organelle in the fiber cells of mammalian lenses. These terminal bodies may play an important role in the proper differentiation of lens fibers and the maintenance of transparency of the lens (Drs. Merriam, Srinivasan). In collaboration with the Section of Radiobiology in the Department of Radiology (Drs. H. Rossi, E. Hall), beam-time has been allotted on the Bevalac accelerator at the Lawrence Berkeley Laboratories to study the nature and biological effects of cosmic-like radiation on the lens (Drs. Merriam, Worgul).

Alignment of the eyes and integrative action of the central nervous system are both essential for normal binocular single vision. Vertical ocular deviations have long posed difficult problems in management to the clinician and these are under investigation (Dr. P. Knapp, Ms. S. Moore). Strabismus in the aphakic patient is also difficult to manage and has not received particular attention in the past; it is of increasing importance in clinical ophthalmology and techniques of management of this problem are being explored (Ms. Moore).

If an intact optical system exists, the retina is the primary source of vision; light energy is transformed by the retina into neural impulses which, on transmission to the brain, result in vision. Blinding retinal diseases continue to be particularly devastating challenges and those due to vascular abnormalities are increasingly prominent in an aging population. Particular attention is being directed toward the therapeutic management of degenerative retinal vascular disease and diabetic retinopathy (Drs. C. J. Campbell, H. F. Spalter).

Juvenile rheumatoid arthritis is not only a disabling disease but has the additional complication of possible blindness. The blindness results from uveitis, often difficult to detect in young children. A new drug is undergoing clinical evaluation for the management of this form of arthritis and its role on ocular complications (Dr. Spalter).

The main research objective of the Matrix Biology Laboratory was to elucidate the structure and function of hyaluronic acid in such connective tissues as the vitreous and synovial fluid. The chemical and physical structure of hyaluronic acid from various sources was extensively studied (Drs. G. Armand, E. Balazs, K. Meyer, Ms. S. Briller). To establish the relationship between the size and conformation of this large polysaccharide molecule and its biological function was one of the main objectives of the research effort. The phagocytic activity of white blood cells is inhibited by Na-hyaluronate and this inhibition depends on the size and molecular interactions (Drs. Balazs, M. Flood). It was also shown that the Na-hyaluronate inhibits prostaglandin formation *in vitro* (Drs. Balazs, Eakins, Mr. J. Sebag) and promotes the aggregation of red blood cells (Mr. G. Arzeno, Dr. Balazs). Studies on the role of this macromolecule in the function of normal and pathological joints was continued (Dr. Balazs, Ms. J. Denlinger). In more than one thousand human eyes obtained from the New York Eye Bank, we established an age-dependent relationship between the collagen and hyaluronic acid content and the gel and liquid characteristics of the vitreous (Drs. Balazs, Flood). Another important study in this laboratory was centered on the subhuman primate vitreous. Studying owl and rhesus monkeys, we established that the latter has a very human-like vitreous, and therefore it is thus far the best animal model for vitreous research. In a field study at the Caribbean Primate Research Center of the University of Puerto Rico, the eyes and joints of more than 120 rhesus monkeys of all age groups were studied (Drs. Balazs, J. DeRousseau, G. Eisner, Ms. Denlinger). The result of these studies was the establishment of the human-like macular degeneration in these monkeys (Drs. Balazs, Eisner, A. El-Mofty, P. Gouras). Clinical studies on the use of very viscous solutions of Na-hyaluronate during and after cataract and glaucoma surgery were begun (Drs. Balazs, L. Pape).

In the Biochemistry and Molecular Biology Laboratory, a considerable effort was spent in studies on normal and cataractous human lenses. A high molecular weight disulfide-linked protein aggregate was found in cataractous lenses but not in normal lenses (Drs. D. Roy, A. Spector). Such aggregates

are of sufficient size to affect the transparency of the lens. Investigation of these aggregates has clearly shown that they contain cell membrane polypeptides which may act as nucleation sites for the formation of these giant aggregates (Drs. M. H. Garner, W. H. Garner, Roy, Spector with Dr. P. Farnsworth at New Jersey College of Medicine). An important study relating to the age dependent development of fluorescence of human lenses has shown that bitrosine is present in the human lens. This material may act as a cross link binding polypeptide chains together, thus contributing to the formation of the high molecular weight protein aggregates found in cataract (Drs. J. Dillon, S. Garcia Castineiras, Spector). Work on the water insoluble protein of the human lens has led to the development of techniques for the isolation and characterization of insoluble polypeptides (Drs. Roy, Spector). An important new approach to measure the aging of lens proteins was developed, and it was found that the insoluble fraction of the proteins appears to age at a constant rate while the soluble lens protein does not appear to age significantly (Drs. Garner, Spector). The effect of low temperature on the associating-dissociating process of lens proteins was studied (Dr. L. Li). The increase of insoluble protein disulfides during cataract formation was studied and the suggestion was made that the primary structures of cataractous proteins have undergone post-translational changes (Drs. E. Anderson, J. Chen, Spector).

In the Immunology Laboratory, studies were continued on the relationship between the distribution and immunogenicity of antigenic determinants and the subunit structure of lens proteins (Drs. K. Malinowski, W. Manski). Antibodies to antigenic determinants which do not occur on separated subunits but are dependent on the quaternary structure of alpha crystallin were used to study the extent of restitution of the native molecule by different proportions of interacting subunits. An off-shoot of the immunochemical studies on the molecular evolution of lens protein, a new method for quantitative precipitin tests, was developed (Drs. Malinowski, Manski). Studies on corneal transplantation in rats with adjuvant arthritis were continued (Drs. Manski, Santamaria). It was found that in contrast to normal controls in the same inbred strain, the arthritic animals showed distinct reactions after syngeneic intralamellar corneal transplants. The cellular immunity to artery antigens in patients with vasculitis syndromes was studied, and it was found that the mononuclear cells in cases of temporal arteritis and/or retinal arteritis and presumed sarcoidosis were inhibited by artery antigens (Dr. A. Hofeldt).

In the Physiology Laboratory, work continued on

the basic description of prostaglandin transport mechanisms, especially on the kinetics of these transport mechanisms and their physiological function. It was demonstrated that inhibitors of prostaglandin transport enhance the effects of topically applied prostaglandins on both the brain and the retina (Drs. L. Bito, M. Wallenstein). Evidence was found that prostaglandins may be involved in some form of epileptogenesis, and that impaired prostaglandin removal mechanisms across the blood-brain and blood-retinal barriers may contribute to the pathophysiological effects of these autocooids on central nervous tissues. It was also found that low concentrations of topically applied prostaglandins can reduce intraocular pressure, in contrast to the inflammatory effects of high concentrations. Physiological prostaglandin levels may be involved in the normal regulation of intraocular pressure (Drs. Bito, Eakins, Mr. C. Camras). Work was also continued on the mechanism of ocular inflammation and the effect of uveitis on intraocular fluid composition (Drs. Bito, D. Stetz). Correlation was shown between cholinergic sensitivity of the iris sphincter and the concentration of muscarinic receptors in this tissue. This supports the hypothesis that muscarinic target organ sensitivity is a dynamic phenomenon that can be best explained by changes in receptor concentration (Dr. Bito).

The Pharmacology Laboratory continued its work on the role of the products of arachidonic acid metabolism in ocular inflammation and the development of drugs which selectively interfere with the various steps involved (Mr. G. Allen, Drs. P. Bhattacharjee, Eakins). Thromboxane synthetase inhibitors as pharmacological tools were studied on platelet aggregation, and it was concluded that the lack of specificity of these compounds requires that the other actions of these compounds must be considered when they are used to inhibit thromboxane biosynthesis (Drs. Eakins, and P. Needleman, Washington University). It was discovered that prostaglandins have a pressure lowering effect which appears to be due to a direct effect on the outflow of aqueous humor (Drs. Bito, Eakins, Mr. Camras). The re-epithelialization of rabbit corneas was investigated and it was found that the polymorphonuclear leukocytes which are present in denuded corneas may influence the course of re-epithelialization (Drs. Eakins, Iwamoto, Srinivasan, Worgul).

The major interest of the Laboratory of Membrane Biology continued to be centered on the problem of fluid transport across epithelia (Drs. J. Fischbarg, Lim, Ms. G. Fischer). A theoretical model was developed to represent such fluid transport. The intracellular potential of the fluid-transporting corneal en-

dothelium was determined (Drs. Lim, C. Roberts). In collaboration with Dr. G. Whittembury (Physiological Laboratory, University of Cambridge, England), the ionic concentration of the fluid transported by an important model epithelium, the frog skin, was determined (Dr. Fischbarg). Some theoretical consequences of the existence of unstirred layers near the epithelia were investigated (Drs. Fischbarg, T. Pedley). A specialized dissection technique needed for the study of corneal endothelium was developed (Drs. Iwamoto, Fischbarg, Roberts, H. Soong). Studies on the fluid-transporting properties of the ciliary epithelium were continued (Drs. J. Brodwall, Fischbarg). The development of a computerized optical procedure to determine the osmotic water permeability of cell membranes was started (Drs. Fischbarg, Koester).

The new Neurology Laboratory was established this year, and Dr. Peter Gouras was appointed as head of this Laboratory.

Patient Care

The Edward S. Harkness Eye Institute continues to maintain a position of preeminence in diagnostic capability and in medical and surgical technology for all aspects of patient care. The Columbia affiliated hospitals, particularly Harlem and St. Luke's, are developing similar capabilities. The effort of complete modernization and renovation of the patient care facilities of the Edward S. Harkness Eye Institute continues. There is a total dedication by the Department to this activity and a reasonable prospect now exists of achieving these goals within two years.

The total number of clinical visits in 1978 was 23,604. There were also 3,328 visits recorded in the Fight for Sight Children's Eye Clinic. The number of patients hospitalized was 2,858 for a total of 13,295

days. The total number of surgical procedures in 1978 was 2,941.

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Orthopaedic Surgery

ALEXANDER GARCIA

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Director of Service*

Nineteen seventy-eight has been a year of change in the Department of Orthopaedic Surgery, largely because of the financial pressures on the Hospital brought about by changes in reimbursement and increased operational costs. In response to these pressures, the Hospital was forced to make some difficult decisions regarding the curtailment of hospital beds. After much deliberation, the administration of The Presbyterian Hospital concluded that in order to avoid a huge financial penalty, two hundred beds would have to be closed. The fifth floor of Babies Hospital, which has traditionally been the Children's Service area of The New York Orthopaedic Hospital, was closed, with great emotional and intellectual impact on the entire orthopaedic staff, nurses, and Women's Auxiliary. We now have problems maintaining an identifiable area for the Orthopaedic Children's Service. We are working closely with the administration to see how we can best accomplish our mission within the framework of flexible admitting. There have been many difficulties and some benefits. The areas that have been utilized by the Service are more modern and permit parents to sleep in, which has been a boon to them.

Teaching

The Twenty-Second Annual Postgraduate Course was held from June 12-23, 1978 under the direction of Drs. Howard A. Kiernan, Jr. and Austin D. Johnston. As usual, this was well attended.

Research

With Dr. C. Andrew L. Bassett and Dr. Harshad Chokshi, Richard Stram undertook the study of effects of pulsing electromagnetic fields on longitudinal growth of fetal rat bones. Gary Margules is preparing his thesis for his Ph.D. on "Dynamic impedance studies of interactions at living cell membranes" with Dr. Arthur A. Pilla; Genvieve Cerf, also with Doctor Pilla, carried out studies on computer analysis and modeling of ionic interactions at cell membranes.

The primary goals of the research project continue to be (a) to identify mechanisms by which pulsing electromagnetic fields perturb the function of osteogenic cells; and (b) to determine those characteristics of the pulse which are most important in bringing about a given alteration of bone cell function.

The major research accomplishments of the past year include:

1. Rapid expansion of the program of treating nonunions in adults and children with pulsing electromagnetic fields (PEMFs), and more than 400 patients in more than 40 centers outside the Columbia-Presbyterian Medical Center—NYOH—have been cared for in the past year. With the expanded program, it has been possible to improve both the technology and orthopaedic care system associated with it so that the success rate in adult tibial nonunions now exceeds 90% (200 cases). As confidence in the safety and efficacy of this method has increased, it now is being utilized increasingly in

delayed union to eliminate the need for surgery and to reduce, significantly, disability time and cost.

2. Opening of entirely new approaches to the control of surgical and other infections. Nearly all patients with actively draining, infected nonunions treated with PEMFs have demonstrated a decrease in the amount of drainage and a change in its character (purulent to serosanguineous to serous to cessation). These changes occur well in advance of coil stimulated bony union. They, also, have been observed in a number of individuals following removal of infected total knee prosthesis in whom fusion was being attempted. On the basis of this observation, studies of PEMF effects on bacterial behavior were begun in collaboration with Drs. Charles Fox and S. Modak and with Dr. Charles Findlay and Esther Meyer (Surgery). It is clear, even at the early stages of this investigation, that PEMFs are capable of reducing the growth rate of *Pseudomonas* and *Staphylococcus aureus*. Furthermore, the modality appears to potentiate the activity of antibacterial agents, such as silver sulfadiazine. Furthermore, the apparent synergistic effects of the fields and pharmacologic agents on bacteria dictate a broad evaluation of PEMF usefulness in potentiating or modifying other drug, hormone, and antibody interactions with biological systems.

3. Demonstration that longitudinal bone growth can be stimulated in cultures, in animals, and in humans by PEMFs with the proper pulse characteristics.

4. Demonstration that PEMFs can increase ash weight/body weight ratios in developing animals.

5. Demonstration that "minor" variations in repetition rate and energy distribution, within a given pulse waveform, can have major effects on specific cell functions such as calcium kinetics, ^3H thymidine incorporation and ^3H uridine incorporation.

6. Identification of the mechanism of action of PEMFs in promoting the healing of nonunions. The pulses trigger calcium release by fibrochondrocytes in the gap region, thereby mineralizing the intervening soft tissues and setting the stage for endochondral ossification.

7. Identification of pulse characteristics which increase the rate of fresh fracture repair and of bone graft incorporation.

8. Demonstration that modification of ionic species by PEMFs can trigger dedifferentiation of frog erythrocytes and that this change is associated with uncoiling of DNA (as measured by laser-microfluorometry of Acridine Orange-labeled cells).

9. Demonstration by dynamic impedance methods that Na^+ concentration in bulk solution controls Na^+ transport across cell membranes and that the major

energy (electrical) requirement for Na^+ "transport" is penetration of the membrane phase from the bulk phase (not its passage across the membrane).

At the beginning of the year Dr. Stephen Doty joined the Orthopaedic Research Laboratories to direct the electronmicroscopic program. He brings to the Orthopaedic Research Laboratories an outstanding reputation in studies of the ultrastructure of skeletal tissues and in the histochemical identification of enzymes at the ultrastructural level. Dr. Doty formerly was a member of the faculty at Johns Hopkins with Dr. Robert A. Robinson and, more recently, was a special fellow of the N.I.H. at Bethesda.

Ms. Marguerite Strop also joined the Orthopaedic Research Laboratories on July 1, 1978, leaving her position at the Orthopaedic Research Laboratory at the University of Vermont where she was its director. Ms. Strop has had broad interdisciplinary experience in histology, histochemistry, biomechanics, and statistics and will serve as a research coordinator for the many programs in progress.

The increasingly large number of research and teaching programs in biomechanics prompted the creation, during the year, of a Biomechanics Laboratory which is under the directorship of Mr. Robert J. Pawluk. Mr. Pawluk, a member of these Laboratories for the past fifteen years, has developed a broad capability in this area, which is of central importance to orthopaedic surgery and research. In addition to supporting the main biomechanical requirements of the Orthopaedic Research Laboratories in testing osteoporotic bone and the strength of fracture repair, the Biomechanics Lab is involved in a variety of collaborative studies with other faculty. These include:

- Studies of new methods of fixation of acetabular components in total hips, wear testing of total knee prostheses, and evaluation of prosthetic design. (Dr. Nas S. Eftekhari)

- Studies of artificial ligaments *in vivo* and *in vitro*. (Dr. Joel E. Rothmel)

Strain gauge studies of normal stance load transfer in the hip and pelvis with and without prosthetic replacement (Dr. Christopher B. Michelsen).

Quantification of effectiveness of ischial weight bearing prostheses and orthoses (Dr. Harold M. Dick).

Dr. Pascal Christel, Orthopaedic Surgeon, Research Fellow INSERM, Paris, France (French NIH) did a study of pulsing electromagnetic field effects on fracture repair in rats with Drs. Bassett and Pilla and Mr. Pawluk. Dr. Rene Duriez (Research Fellow) from the Institut Calot, Berck-Plage, France, along with Drs. Bassett and Chokshi and

Ms. Strop, undertook the study of pulsing electromagnetic field effects on DNA synthesis in embryonic chick tibiae. In addition, the Orthopaedic Research Laboratories introduced a number of work/study college students (from Princeton University, Johns Hopkins University, Hiram, and Columbia University) to scientific endeavors in its various programs.

Dr. Robert E. Carroll has continued investigation in the surgery of tumors, tendon transfers, and reconstruction in congenital hands.

Dr. John R. Denton has undertaken clinical research projects on growth plate injuries and their sequelae, and complications of hip fractures treated with the Richards screw device.

Dr. Dick has established a Microsurgery Research Laboratory for the teaching and research of replantation and free vascularized tissue transplants.

Dr. Eftekhar has been involved in the design of operation of total hip acetabular segment and the design of Mark II rotary hinge prosthesis and is conducting research in fixation of tibial element of total knee prosthesis. He is also continuing studies on the wear of artificial knee joints.

Dr. S. Ashby Grantham with Drs. Tom R. Norris and David C. Bush conducted a study of fractures of the capitulum.

Dr. Johnston, in collaboration with Dr. Bassett, is taking part in the histologic appraisal of changes in patterns of skeletal growth and fracture healing under the influence of electrical fields.

Dr. Rosamond Kane has been able to initiate studies on patients with talipes equinovarus under the aegis of Drs. Arthur B. Voorhees, Jr. and Roman Nowygrod and their vascular research team.

Dr. Kiernan has undertaken the study of geometry of knee joints as it relates to meniscal lesions.

Dr. Charles S. Neer II continues to be extremely active in clinical research in many aspects of shoulder surgery such as muscle transfers about the shoulder (with Dr. Norris); humeral head replacement (with Dr. Stephen J. McIlveen); shoulder instability (with Dr. Craig R. Foster); anterior acromionplasty (with Dr. Louis U. Bigliani), and total shoulder replacement—special glenoids.

Dr. Marvin L. Shelton has undertaken studies on the treatment of elbow fractures; developing a fibula plate and bolt for treatment of ankle fractures with rupture of the inferior tibiofibular syndesmosis and has continued a long-term follow-up study of trimalleolar fractures of the ankle treated by open reduction and internal fixation.

Members of our resident staff have also been actively involved in clinical research under the direction of our attending staff.

Dr. Wallace F. Andrew, with Dr. Kiernan, has been reviewing lateral meniscectomy series and, with Dr. Dick, has been working in the newly established Microvascular Surgery Lab.

Dr. Charles B. Beaumont has been conducting research on treatment and prognoses for fractures (and nonunions) of the proximal humerus and the use of Hoffmann apparatus for fixation (external) of tibia-fibula fractures (case review of about 20).

Dr. William H. Call, in collaboration with Dr. Grantham, has undertaken the clinical study of posterior fracture-dislocations of the hip. With Dr. Dick and Dr. William B. Kleinman, he has been working on the resolution of long-standing paraplegia resulting from benign tumors of bone. He has also been doing a study on median nerve entrapment in forearm fractures with Dr. Carroll and on heterotopic ossification syndromes with Dr. Johnston.

Dr. Peter A. Feinstein has been doing a study on the subtalar arthrodesis: An analysis of clinical features associated with revision in fifty patients, with Dr. Alexander Garcia.

Dr. Lawrence C. Hurst has undertaken a study on the relationship of carpal tunnel syndrome and thoracic outlet syndrome.

Doctor McIlveen, with Mr. Pawluk, has been working on a research project dealing with the effects of holes on bones and their relationship to osteoporosis.

Patient Care

During 1978, 4,186 patients were admitted to The New York Orthopaedic Hospital, and 3,242 operative procedures were carried out.

<i>Classification</i>	<i>Number of Procedures</i>
Back	348
Upper Extremity	1,170
Lower Extremity	697
Hip	567
Knee	422
Miscellaneous	38

There were 24,946 clinic visits and 565 patients returned to our follow-up clinic during the year.

Under Doctor Johnston's direction, routine diagnostic service was accorded 1,640 patients, and 500 consultations were carried out in the Orthopaedic Pathology Laboratory. The number of deaths was 13, and 1 autopsy was performed.

Honors and Activities

The Visiting Professor for this past year was Dr. Clement B. Sledge who is Professor of Orthopaedic

Surgery at Harvard who had a very stimulating influence on the entire staff with his presentations and rounds dealing largely with joint replacement.

The Twenty-First Annual Alan DeForest Smith Lecture was given by Dr. Carter R. Rowe, and we were heartened to see that Dr. Alan DeForest Smith, Professor Emeritus and former Director, was present to hear the lecture. At this meeting of the Alumni Association, the Association voted to convert The New York Orthopaedic Alumni Auditorium Fund to a fellowship fund in order to better utilize this money for the benefit of The New York Orthopaedic Hospital. These funds will be used for support of scholarly activities in the postgraduate area.

Dr. Bassett was appointed to the Board of Directors of Electro-Biology, Inc. He was also elected to the Editorial Board of *Bioelectromagnetics* and to the Editorial Board of *International Orthopaedics — Sicot*. Dr. Denton was elected to membership in the Atlantic Bone Club. Dr. Eftekhar was elected Chairman of the Education Committee of the Hip Society.

Dr. Grantham was elected President of the Orthopaedic Section of the New York Academy of Medicine for 1978-79.

Dr. Hugo A. Keim was elected President of the Eastern Orthopaedic Association. Dr. Kiernan became a member of the International College of Surgeons and the New York Academy of Medicine. Dr. Michelsen became a Fellow in both the American College of Surgeons and the New York Academy of Medicine.

Dr. Neer was Visiting Professor at McGill University, Montreal, Canada, and at Albany Medical College, Albany, New York.

Dr. Pilla was appointed Chairman and Member of the Board of Directors of the Organic and Biological Division Electro-Chemical Society, and to the Editorial Board of *Bioelectrochemistry and Bioenergetics*. Dr. Shelton was made Examiner of The American Board of Orthopaedic Surgery and was elected to the Executive Committee of the Orthopaedic Section of the New York Academy of Medicine.

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Harlem Hospital Center

Hospitals in the greater New York area suffered significant cutbacks in funding and in the number of inpatient admissions and percentage of bed occupancy during the fiscal year 1977-1978. This seems to be primarily due to the increasingly contingent criteria for bed utilization.

Teaching

A roster of six orthopaedic residents has been maintained. The affiliation with Helen Hayes Hospital continues, and each resident rotates there for six months in his second year.

Utilization of the core curriculum activities at Columbia-Presbyterian Medical Center and the postgraduate course given each year at the College of Physicians & Surgeons continues.

Research

Long-term follow-up study on the fixation of more than 300 trimalleolar fractures was completed and presented at the Annual Meeting of the American Academy of Orthopaedic Surgeons, Dallas, Texas in February 1978.

Data collection on repair of injuries to the ankle syndesmosis using a fibula plate and bolt is continuing.

Patient Care

A total of 514 patients were admitted for inpatient care. The adults numbered 395 and 119 were pediatric patients. A total of 342 patients underwent major orthopaedic procedures of which 304 were adults and 38 were pediatric patients. This represents approximately a 10% reduction compared with the preceding fiscal year.

A total of 8,156 patients received treatment in the Orthopaedic Outpatient Clinics, of which 1,661 were pediatric patients. The Orthopaedic Staff also assisted in the treatment of 1,189 patients in the Hand Clinic and in the evaluation and treatment of patients in multiple disciplinary amputee and pediatric re-

habilitation clinics in conjunction with the Department of Physical Medicine and Rehabilitation.

Helen Hayes Hospital

The building program for the enlargement and expansion of the Helen Hayes Hospital is well under way with plans for completion of the new facility in 1980. Dr. Alice L. Garrett continues to lead the hospital with energy and vigor, maintaining optimal care for severely handicapped patients with a multidisciplinary approach that involves an enthusiastic and innovative staff.

The Children's Program continues to serve as a focal point for the referral of children with severe orthopaedic handicaps including cerebral palsy, spina bifida, birth defects, and miscellaneous orthopaedic abnormalities. This service area enlarges each year such that it now encompasses the Northeastern portion of the United States.

Dr. Raphael K. Levine maintains the direction of the Children's Service with a special interest in the multidisciplinary involvement of the cerebral palsy child. The Cerebral Palsy Service under the co-direction of Dr. Levine and Dr. Marguerite Gates, our staff pediatrician, continues to expand its services with progressive growth of the cerebral palsy service designed to improve the functional capacity of handicapped children. This service has become increasingly involved with local agencies in New York and adjoining states such that the optimal function that is brought about at the Helen Hayes Hospital can be maintained in the child's home setting.

Drs. Abraham C. Kovarsky and Matilda B. Brust, staff pediatrician, continue to co-direct the Spina Bifida Service with the ultimate aim to maintain the child in a functionally optimal situation such that he can conduct himself in a satisfactory manner in his normal social setting.

The Biomechanics Research Laboratory, guided by Dr. George Van B. Cochran, continues to contribute to the clinical care of the entire patient population at the Helen Hayes Hospital with sophisticated techniques for the analysis of gait neuromuscular control and energy consumption. The laboratory has much to contribute to general information which will be helpful to the entire medical community. Funded research studies which are under way include biomechanical assessment of the disabled child, development of test standards for wheelchair cushions, determination of the electrical factors affecting bone and tissue healing, biomedical aspects of cartilage in weight bearing and nonweight bearing cartilage, acceleration of bone and soft tissue healing by electrical stimulation, functional electrical stimulation of the upper and lower extremities, and identification and

control of biophysical factors responsible for soft tissue breakdown.

The Children's Amputee Program has expanded considerably under the co-direction of Drs. Brust, Kovarsky and Rodolfo Reyes (Physical Medicine and Rehabilitation). Drs. Kovarsky and Reyes are involved in the care of the management of adult amputees as well.

The Scoliosis Service is now under the direction of Dr. Leela Rangaswamy, who maintains her interest in evaluating the effects of the Boston Brace Orthotics Program in the care of both idiopathic and pathological curves. Additionally, she has maintained a close tie with the community in screening school children for scoliosis and has been involved in the orthopaedic training of Columbia medical students who have been visiting the hospital on a regular rotation. Dr. Rangaswamy maintains direction of the Adult Cerebral Palsy Service which has benefited from her wide experience in caring for this type of handicapping problem.

Under the direction of Dr. Louis Bigliani the new Chief of Adult Surgical Services, early strides have been made to establish the Hospital as a referral center for patients with severely involved shoulder pathology. Additionally, he has shown a significant interest in continuing to provide service for patients in need of joint replacements.

Dr. Bigliani has maintained a close tie orthopaedically to the Arthritis Service, under the direction of Drs. Alfred Becker and Howard Blank, with rounds participation and surgical intervention for the optimal benefit of the patient.

Dr. Nailor has joined our staff within the past year to assist Dr. Bigliani in the care of the adult orthopaedic population, particularly in the evaluation of the severely traumatized patients as well as in the provision of orthopaedic care as found necessary in patients with cerebral vascular accidents and spinal cord pathology.

Members of the staff have continued to be involved with the provision of care on a community level as well as with care within the hospital. Drs. Garrett, Levine, and Kovarsky are active faculty members of the New York University School of Orthotics and Prosthetics. Dr. Bigliani has become involved in the provision of orthopaedic care for the New York State Correctional Institutions. Drs. Gates, Garrett, Rangaswamy, and Levine have continued to maintain close ties with the Rockland County Center for the Physically Handicapped as well as for the Orange County Cerebral Palsy Center.

The residency program flourishes with a full complement of residents from The New York Orthopaedic Hospital as well as the Harlem Hospital.

Center rotating on a regular basis through the Helen Hayes Hospital. Members of the residency staff are exposed to the direct involvement necessary as mem-

bers of a team approach to major medical problems. They also participate in various research projects that are under way at the hospital during their rotation.

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Otolaryngology

MAXWELL ABRAMSON

Professor and Chairman of the Department • Director of Service

Undergraduate Teaching

The Otolaryngology Department continues to teach a fifteen hour course every six weeks in the principal clinical year. This functions as a tutorial, based on a great effort by the entire department, with all other activities curtailed during the period. This has been very successful according to reports of students and teachers.

The fourth year elective includes a clinic rotation for primary care students in medicine, as well as a one month clerkship on the service. We continue to attract students from other schools as well as P&S students to this clerkship.

Resident Teaching

The major teaching effort of the department continues to be resident education. We are attracting an outstanding group of residents, with approximately 50% graduates of P&S. Daily rounds and conferences are supplemented by a temporal bone microsurgery course, under the direction of Dr. Lawrence Savetsky and a head and neck dissection anatomy course in the first year given by Dr. Stanley Whitfield. The Basic Science Course given jointly by the Otolaryngology faculty at Mount Sinai, Albert Einstein and Columbia attracts first year residents from all ENT programs in New York City. Resident education is directed by Dr. Andrew Blitzer.

Postgraduate Education

The Department sponsored three postgraduate courses this year. Dr. John Conley directed a course

on "Complications in Head and Neck Surgery." The two other clinical postgraduate conferences were one day in duration, featuring a renowned visiting professor, with case presentations from the audience and talks on new developments in the field from members of the department. These conferences have attracted a large number of local practitioners and will be continued two to three times a year.

Research

The work of the Fowler Memorial Laboratory has continued in the following areas: 1) Interferometric measurements of basilar membrane displacement (S.M. Khanna and J. Tonndorf); 2) Single-fiber recordings (S.M. Khanna); 3) Power transfer of the peripheral portion of the auditory system (S.M. Khanna, M. Teich, C. Sherrick of Princeton University); 4) Directional hearing by bone conduction (J. Tonndorf); 5) A model for bone conduction thresholds (S.M. Khanna and E. Corliss); 6) Bone conduction threshold measurements (J. Queller and S.M. Khanna).

Dr. Cheng C. Huang is studying proteolytic enzymes in human head and neck cancer in an animal model of epidermoid carcinoma. He is collaborating with Drs. Andrew Blitzer and Maxwell Abramson on studies correlating the proteolytic enzymes mechanism with certain biologic parameters of tumor growth and behavior. Dr. Blitzer's particular area of interest is in the interaction of tumor with bone and cartilage.

Drs. Abramson and Huang continue their studies

on the mechanism of chronic inflammatory bone destruction, using a guinea pig as animal model, as well as with biochemical studies of collagenase and other proteases and destructive agents.

Clinical research continues to occupy members of the Department. Dr. Frank V. Mignogna is analysing the ENT manifestations of a larger group of patients with Wegner's granuloma. Dr. Robin M. Rankow continues his clinical studies on temporomandibular joint dysfunctions and parotid tumors.

Dr. Conley maintains an extensive on-going clinical research program, analysing the clinical course of his large group of patients with head and neck cancer. He also continues to improve methods for reanimation of the paralyzed face.

There are several collaborative projects under way, including Dr. Rankow with Dr. Edgar Housepian (Neurosurgery), who are treating malignant tumors of the orbit, using a combined cranial-facial approach. Dr. Abramson with Dr. James McMurtry (Neurosurgery) have worked out an integrated approach to chronic ear disease, involving intra-cranial structures and with Drs. McMurtry and Peter Carmel (Neurosurgery) have improved methods for combined otoneurosurgical treatment of acoustic neuromas.

Patient Care

Our clinic continues to be active, in spite of the slight drop in census over the last year. Our ability to provide a high level of care to this large clinic population is due to the dedicated hard work of our six residents, the ENT attendings and the organizational talents and the competence of Josephine Goldberg, our clinic nurse.

The Head and Neck Division, under Drs. Abramson, Rankow and Andrew Blitzer, functions as a multi-disciplinary patient care, teaching and research unit. The multi-disciplinary character of this unit, is maintained by active and regular participation by Otolaryngologist, Psychiatrist, Prosthodontist, Social Worker, Physical Therapist, Radiation Therapists and Plastic Surgeon. We have two new members of the Division of Medical Oncology, Drs. Jahan Raafat and Steven Cvitkovic, and with them have begun a program of adjuvantive chemotherapy for certain patients with head and neck tumors.

Statistics

PH Semi Private	833
PH Ward	202
ENT Harkness	284
Babies Hospital	444
Total	1,763

Patients seen in the ENT Clinic 12,193

Honors and Staff Activities

Dr. Abramson was elected to the Executive Council of the Association of Research in Otolaryngology and appointed to the Communicative Disorders Review Committee of the NINCDS. He is a member of the editorial board of the *Journal of Communicative Disorders* and has been appointed series editor for otolaryngology for Marcel Dekker, Incorporated. He was visiting professor at Mount Sinai, Albany and Yale and was invited to lecture at the Massachusetts Eye and Ear Infirmary Alumni Society, the course on Radiology and Head and Neck in New York City, Englewood Hospital and Bergen County ENT Society. He was elected to membership in the New York Otological Society and the New York Laryngological Society. He presented a paper on the medical treatment of Meniere's Disease at the annual meeting of the Neuro-otology Society in Palm Beach.

Dr. Ramesh Agarwal won first prize in the Resident Competition for research, given by the Otolaryngology Section of the New York Academy of Medicine.

Dr. Blitzer received a Teacher-Investigator Development Award from the National Institute of Neurological Communicative Disorders and Stroke, to support his research on Laryngeal Connective Tissue Response to Cancer. He has been appointed to the faculty of the American Academy of Otolaryngology Continuing Education Committee for Practitioners. Dr. Blitzer lectured at the New York Academy of Medicine and presented a scientific poster at the annual meeting of the American Academy of Otolaryngology.

Dr. Conley presented papers at the combined Otolaryngology meeting in Florida, at the Society of Head and Neck Surgeons in Toronto, the Annual Meeting of the American Academy of Otolaryngology and the American College of Surgeons. He directed a course on "Complications in Head and Neck Surgery," at Columbia University. Dr. Conley was visiting professor or invited speaker at the University of California, San Diego; University of Cincinnati, Indiana University, Yale University, Connecticut Medical Society, Mount Sinai, Portland Medical Society, the Meeting of the American Society of Plastic and Reconstructive Surgeons and the New York Cancer Society. Dr. Conley serves on the Board of Directors of the American Academy of Otolaryngology and on the Advisory Council for Otolaryngology of the American College of Surgeons.

Dr. Thomas H. Fay serves on the Executive Committee of the New York State Speech and Hearing Association. He was appointed by Mayor Koch as member of the Council of Environment of New

York City and as Chairman of its Committee on Noise Abatement and was appointed member of the Board of Supervisors of Hunter College Graduate Program in Speech, Hearing and Communicative Disorders. Dr. Fay has made appearances on radio and television, speaking on noise abatement and hearing impairment.

Dr. Huang was awarded a Research Grant from the National Cancer Institute for the study of the "Mechanism of Connective Tissue Resorption in Head and Neck Cancer." Dr. Huang with Dr. Abramson was awarded first prize for basic research by the American Academy of Otolaryngology for the study of "Localization of Collagenase in Inflamed Guinea Pig Temporal Bone."

Dr. Robert M. Hui lectured at the combined meeting of the Philadelphia Society of Otolaryngologists and the New York Medical Academy on "Surgical Aspects of Hyperthyroidism with Proptosis."

Dr. Shyam M. Khanna presented papers at the Neuroscience Satellite Symposium at the annual meeting of the American Acoustical Society.

Dr. Richard Mega lectured at Columbia Teacher's College.

Dr. Mignogna presented a paper at the International Meeting of the European Society of Maxillofacial Surgeons on "Carcinoma of the Mandible Presenting as a Parotid Mass."

Dr. Rankow was appointed to the Editorial Board of the *Annals of Plastic Surgery*. He has lectured and presented papers at the annual meeting of the Spanish Society of Maxillofacial Surgeons, the combined meeting of the New York Academy of Medicine and the College of Physicians of Philadelphia; on "Complications in Head and Neck Surgery," at Columbia and at the European Association of Maxillofacial Surgeons and the joint meeting of the American Society of Plastic and Reconstructive Surgery and the American Society of Maxillofacial Surgeons.

Dr. Juergen Tonndorf received the award of merit of the American Otological Society and was made honorary member of the American Academy of

Otolaryngology. He presented papers and lectured at the Association of Research in Otolaryngology, The Inner Ear Workshop in Innsbruck, Austria, Collegium ORLAS, American Acoustical Society, Lexington School for the Deaf, National Hearing Society, Philadelphia Society of Laryngology, Bethesda Naval Hospital and the City University.

Dr. Jules G. Waltner was visiting professor at the University of Lisbon, Portugal.

Affiliated Hospitals

Dr. Stanley Whitfield, Director of Otolaryngology at St. Luke's Hospital Medical Center, served as Chairman of the ENT Section of the New York Academy of Medicine, organized four meetings and a joint meeting in Philadelphia with the ENT Section of the Philadelphia Academy of Medicine. He continues on the Board of Directors of the New York State Society of Otolaryngologists and as Chairman of its Malpractice Committee. Dr. Whitfield presented a paper at the New York Academy of Medicine on "Leprosy of the Larynx."

Dr. John Lewis, Director of Otolaryngology at the Roosevelt Hospital, was elected Vice-President of the Eastern Section of the Triological Society.

Dr. Ransford C. Newman, Acting Director of Otolaryngology at the Harlem Hospital Center, has maintained an active service and continues to improve patient care and teaching at that institution.

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Pathology

DONALD W. KING

Delafield Professor and Chairman of the Department • Director of Service

Teaching

The Departmental teaching program continued its four major courses. The Medical School course (Director: Dr. A. Whitley Branwood), Neuropathology (Dr. Philip Duffy and staff), Oral Pathology (Drs. Melvin Blake and David Zegarelli) and Surgical Pathology (Drs. Cecilia Fenoglio, Nathan Lane and staff) were all well received.

Postgraduate continuing education courses presented this year included: Diagnosis & Advances in Surgical Pathology (Drs. Cecilia Fenoglio and Nathan Lane), Advances in Clinical Pathology (Drs. Paul Ellner, John Nicholson and Thomas Blumenfeld), Diagnosis & Advances in Medical Pathology (Dr. A. Whitley Branwood and staff), Renal Pathology (Drs. Conrad Pirani and staff), Orthopedic Pathology (Dr. Austin Johnston) and Review Course in Urologic Pathology (Dr. Myron Tannenbaum).

The CCNY Pathology course coordinated by Dr. Gerda Nette and the Basic Medical Science Review Course directed by Dr. Lester Geller were outstanding successes. A grant from the HSA-HEW has allowed the purchase of an extensive in-house closed circuit television system allowing lectures and demonstrations utilizing specimens and gross microscopic slides to be recorded and transmitted to several areas simultaneously.

A new teaching seminar room, residents' room and wet laboratory for demonstration courses were completed.

Research

Pathobiology and Genetic Pathology

Dr. Richard Axel's laboratory has been concerned with the organization of specific genes in the chromosome with the ultimate goal of understanding the mechanism responsible for the selective expression of these genes. The lab has demonstrated that the hormonally regulated ovalbumin gene is maintained in an extended conformation in the chromosome, readily accessible to DNA binding proteins only in those cells active in ovalbumin synthesis. In concert with these studies on the structure of the ovalbumin gene in the chromatin, they have examined the primary sequence organization of this gene and found that the ovalbumin gene is not contiguously colinear with its translational product.

Drs. Henry Vogel and Ruth Vogel and their collaborators are continuing their studies on the translational mode of enzyme repression in the arginine biosynthetic system. Messenger RNAs are produced by *in vitro* transcription of transducing-phage DNA segments carrying *arg* genes from the *Escherichia coli* chromosome. The messenger RNA's are used *in vitro* either for enzyme synthesis or for the formation of translational initiation complexes, under various regulatory conditions. *In vivo* translational studies utilize streptomycin-resistant mutants, in which enzyme levels and repressibility are affected.

Dr. Gabriel Godman reports that the disposition and regulation of the contractile and cytoskeletal

structures of paired normal and transformed (neoplastic) cells are being investigated in various altered states and by means of cytopharmacological probes, including cytochalasins, spindle poisons, local anaesthetics and Ca-ionophore. The mechanism of the cell rounding (retractile) reaction of cell injury, compared with that following application of several active agents to cells in culture has been under scrutiny, with special reference to the altered arrangements of the plasma membrane associated cortex and the generalized trabecular network of the ground cytoplasm. Of special interest have been the relationships of the structures governing cell shape and anchorage (adhesion) to the capacity for growth and proliferation.

Dr. Seth Goldberg is investigating the molecular mechanism of (ribosomal DNA) *magnification* in *Drosophila Melanogaster* bb mutants (partial rDNA deletions). This phenomenon is intimately associated with an inducible, site specific system for both *Sister Chromatid Exchange* (SCE) and meiotic recombination, determining the relationship between the special recombination system involved in bb magnification and the various pathways of DNA repair in *Drosophila*.

Dr. Reba Goodman devoted the past year to studies of the correspondence between puff formation induced by exogenously administered ecdysone and the formation of puffs during normal larval development in *Sciara coprophila*.

Dr. Sidney Pestka's work on human interferon concentrated on purification of human leukocyte interferon and on isolation of RNA for both major human interferon species in order to determine the primary sequence of the interferons and to clone the human interferon genes and DNAs complementary to mRNA. Studies of the immunoglobulin synthesis resulted in the determination of the precursor sequence of a murine heavy chain.

Dr. Carmia Borek's studies are mainly concerned with the qualitative and quantitative aspects of carcinogenesis *in vitro* and *in utero* by low doses of ionizing radiation, and in the modulating effect of promoters such as phorbol esters or inhibitors such as retinoids. Recent findings have shown that high LET radiation such as neutrons with doses as low as 0.1 rad or argon ions (1 rad) are much more efficient in producing malignant cell transformation as compared to x-rays.

Dr. Arline Deitch has collaborated with Drs. P. Marks, C. Maniatis, R. Rifkind (Genetics) and their associates in studies on transformed erythroid cells, using agents which induce or inhibit differentiation.

Drs. Gerda Nette and Donald West King are continuing their study on the cytoplasmic-nuclear in-

teraction of cells. Using nuclear and cytoplasmic genetic markers, they have succeeded in isolating and growing viable cells by transplanting isolated human nuclei (karyoplasts) into enucleated mouse cytoplasm (cytoplasts). These reconstituted cells were identified from other possible fusion combinations by karyotypic, enzymatic and mitochondrial DNA analysis.

Immunopathology

Dr. Nicole Suci-Foca reports that her laboratory has provided the first evidence that HLA-D and DR antigens are coded by different loci. This discovery is unanimously recognized as being of utmost importance in view of its implications for the understanding of: 1) mechanisms of allograft rejection and 2) mapping of disease susceptibility genes linked to HLA. In addition, she has provided the first description of the polymorphism of LD2. In addition, she has provided the first description of the polymorphism of LD2. LD2 antigens stimulate the allogeneic recognition process and may thus contribute to the immunogenicity of allogeneic grafts.

With Drs. John Nicholson and Pablo Rubinstein, Dr. Suci-Foca discovered that the JDM gene is closer to HLA-DR and that it is in linkage disequilibrium with DRW3 rather than with the corresponding HLA-D antigens. DRW3 and DRW4 homozygotes, as well as individuals heterozygous for both these genes, are at significantly higher risk to develop JDM than heterozygotes carrying only one of them.

Dr. John Nicholson, with Drs. Nicole Suci-Foca and Pablo Rubinstein, extended the study of HLA association with diabetes mellitus in early life. With Dr. J. C. Collins, Dr. J. C. Jacobs and Dr. N. Suci-Foca, Dr. Nicholson initiated an evaluation of HLA antigens in families of patients with arthritis and inflammatory bowel disease.

Dr. Pablo Rubinstein has used non-inbred mice to ask questions about the structure and formal genetics of the murine homologue of HLA. They have succeeded in showing linkage to H-2 of GLO and, very recently, of C3.

Dr. Daniel Knowles' research includes an evaluation of lysosomal enzymes as markers for lymphocyte cell populations from patients with malignant lymphomas. Correlative studies with Dr. F. Jakobić investigated the immunologic, histologic, and ultra-structural features of the extranodal lymphoid lesions, particularly those involving the orbit.

Dr. Peter McCue is studying tissues from patients with pemphigus and pemphigoid syndrome for the presence of basement membrane anti-bodies.

Dr. Clayton Natta is assaying factors determining the regulation of hemoglobin synthesis in sickle heterozygotes and thalassemia heterozygotes in collaboration with Dr. Bank (Medicine). In addition, he is studying mechanisms underlying the binding of globin to sickle stroma.

Dr. Ricardo Mesa-Tejada, working with Dr. S. Spiegelman (Institute of Cancer Research) and Dr. C. Fenoglio, provided immunohistochemical evidence for the presence in human breast carcinomas of an antigen immunologically related to the group-specific antigen (gp52) of the mouse mammary tumor virus.

Dr. Harry S. Joachim has continued his studies on the immunology of human tumors particularly of the lung and ovary and also studies of antigenic expression in viral lymphomas and leukemias.

Dr. Jacob Furth has concluded experiments on induction of gonadotropic tumors with Drs. D. Linkie (Obstetrics-gynecology) and D. Kaul (Fellow). He has also worked out a semiquantitative specific immunohistochemical stain visualizing all pituitary cell types.

Dr. Mary Lee's research project involves the study of red cells and blood vessels ultrastructure with Dr. S. Chien (Physiology). Dr. Lee studies red cell morphology by transmission electron microscopy (OTEM), scanning electron microscopy (SEM) and arterial luminal surface examination by combined techniques.

Dr. Francisco Rincon has been instrumental in designing new programs in the evaluation of Rh disease.

Medical and Surgical Specialty Pathology ***Neuromuscular Skeletal***

Dr. Philip Duffy, in collaboration with Drs. Graf and Rapport (Biochemistry), has demonstrated by immunoperoxidase stains, glial fibrillary acidic protein in certain brain tumor cells. This protein serves as a specific marker with the 9 nm filaments of glial cells. In collaboration with Dr. Kremzner (Biochemistry), Dr. Duffy has studied the relationship between polyamine metabolism and *in vitro* senescence of human cells. Ornithine decarboxylase (ODC), the enzyme that controls the decarboxylation of ornithine to putrescine, has a decreased activity in senescence of human fibroblasts in culture.

Dr. Virginia Tennyson's group continued investigations on the effects of reserpine on the nervous system of pregnant rabbits and their fetuses. They found that chronic reserpine administration to the dam causes lesions in her brain and also in the putamen of her fetuses. In collaboration with Drs. A. Miranda and A. Hays, she studied selected human

muscle diseases by electron microscopy. They are particularly interested in determining whether abnormalities found in the biopsy are also found when parts of the biopsy are grown in tissue culture.

In collaboration with Dr. Salvatore Di Mauro (Neurology) and co-workers, Dr. Armand Miranda studied the properties of phosphorylase in muscle cultures derived from patients with McArdle disease. With Dr. William Johnson (Neurology), Dr. Miranda reported a newly recognized hexosaminidase deficiency disease in a male infant. With Dr. E. Gamboa (Neurology), he completed their investigations on influenza A virus infection in cultured human muscle. In collaboration with Dr. Nette, he examined the effects of dimethyl sulfoxide on differentiation of L8 myoblasts (an established cell line of rat skeletal muscle).

Dr. Arthur Hays has continued his studies with Dr. E.T. Gamboa (Neurology) of host factors involved in the experimental production of myositis in rodents by influenza A virus. With Drs. S. DiMauro and A. Miranda, Dr. Hays has initiated studies of the localization of the lysosomal enzyme, acid maltase, in tissue and cultured cells from muscle using the immunoperoxidase method.

Drs. Richard Defendini and E.A. Zimmerman (Neurology) at the International Conference on the Neurohypophysis and at the Association for Research in Nervous and Mental Disease Symposium made a presentation on the mammalian magnocellular neurosecretory system. With Drs. G. Nilaver (Neurology) and Zimmerman, an immunocytochemical study has been completed demonstrating the presence of adrenocorticotropin and P-lipotropin in the same ovine hypothalamic nerve cells by sequential staining for the two hormones on the same tissue section.

Dr. Leon Roizin focused attention on the relevance of the structural co-factor (chemogenic lesion) in adverse and toxic reactions of neuro-psychotropic agents. The studies were carried out on: a) human postmortem material (including a variety of human controls, i.e. CNS of patients who died as a result of accidents, etc., not involving the CNS), and b) various species of animals of both sexes and various ages (from embryos to adults) who were treated with tranquilizers, some stimulants and antidepressants, narcotics and hallucinogens. Determination of the composition of human biogenic amine neurotransmitter pigments by histochemistry and microfluorometry were carried out by Drs. L. Roizin and H. Barden.

Dr. Austin Johnston and Dr. R.S. Mathews (Hershey) have studied electron microscopy of bone tumors, particularly tonofilaments in adamantinoma, ruffles and possible virions in giant cell tumor and

mucin vacuoles in chondrosarcoma. Dr. M. Parisien and Dr. A. Johnston have studied various modes by which avascular necrosis of the femoral head can occur.

Cardiovascular-Pulmonary

Dr. John Fenoglio, with Dr. Andrew Wit (Pharmacology) has continued studies on the structural and electrophysiology changes associated with cardiac arrhythmias. With Dr. T.D. Pham and Ms. P. Boyden (Ph.D. candidate, Pharmacology), they are determining the ultrastructural and electrophysiologic changes in the atria of animals with natural occurring heart disease and the relationship of these changes to the development of atrial arrhythmias. Dr. Fenoglio has continued to pursue his studies on the structural changes of the myocardium in disease. Mr. G. Lattimer (Ph.D. candidate) is currently investigating the ultrastructural changes of the ventricular myocardium associated with congestive heart failure.

Drs. William Blanc, Adrian Moessinger and J. Bassi (Inst. Human Nutrition) have developed an animal model of pulmonary hypoplasia. Unexpectedly, the removal of amniotic fluid late in the rat pregnancy produces a moderate but significant growth retardation without altering placental growth.

Dr. H. Joachim Wigger, in collaboration with Drs. K. Hsu (Microbiology) and P. Caldwell (Medicine) is continuing his study of the localization of angiotensin converting enzyme by electron microscopical immunocytochemistry. With Drs. Y. Enson and H. Thomas III (Medicine), he is investigating the relationship of pulmonary hypertensive changes in chronic interstitial lung diseases.

Dr. Jack W.C. Hagstrom, in collaboration with Dr. F.J. Veith (Department of Surgery, Albert Einstein College of Medicine), is studying the long-term function and morphologic effects of canine lung autografts with contralateral ligation of the pulmonary artery.

Dr. Jerome Cantor has been collaborating with Drs. I. Mandl (Gynecology), G. Turino (Medicine) and S. Ryan in investigating the changes in the connective tissue in pulmonary fibrosis.

Gastrointestinal-Hepatobiliary

Dr. Nathan Lane has continued investigations with Dr. Robert Pascal and Dr. Cecilia Fenoglio into the precursor tissue for ordinary colorectal cancer. In addition, Dr. Lane has completed studies with Drs. R. Lattes and C. Haagensen (Surgery) on lobular neoplasia and early cancers of the breast.

Dr. Marianne Wolff has continued her studies of the focal nodular hyperplasias of the liver with Dr. D. Knowles. In addition, she has reported on the features of mesotheliomas and keratoacanthomas and is completing a study on benign metastasizing leiomyomas.

Dr. Karl Perzin continued his studies with Dr. Y.S. Fu (Case Western Reserve) on non-epithelial tumors involving the nasal cavity, paranasal sinuses and nasopharynx. The eighth paper in this series (on adipose tissue tumors) was published in *Cancer*, and a study correlating histologic features of adenoid cystic carcinomas with the clinical course and a study of acinic cell carcinomas arising in salivary glands have been completed.

Dr. Janis Klavins investigated the etiology and pathogenesis of pancreatic carcinoma.

Renal-Genito-Urinary Tract

Drs. Conrad Pirani and Fred Silva report on the sequential study of anti-GBM induced glomerulonephritis with Dr. John R. Hoyer (Harvard, Boston) the effect of islet-cell transplantation on renal function and structure with Drs. Reemtsma, Hardy and Weber (Department of Surgery) the effect of elevation of renal vein pressures on renal function and structure with Dr. Rawle McIntosh (Denver, Colorado) and the effect of neuraminidase or histamine when injected into the renal artery of rabbits.

Dr. John Scholes focused his clinical research on amyloidosis in chronic heroin addicts, in conjunction with Drs. Pirani, Derosena, Appel, Jao and Boyd (Department of Medicine).

Dr. Robert Pascal has continued studies of the antigens and specificity of antibodies in human glomerulonephritis and glomerular immune complex deposits associated with tumor-related antigens and antibodies (with Dr. S. F. Slovin).

Dr. Myron Tannenbaum undertook an extensive ultrastructural study by means of scanning electron microscopy (SEM) and transmission electron microscopy (TEM) on all parts of the GU system where there is urothelium or transitional epithelium that is normal, preneoplastic or neoplastic. These studies were done in part in conjunction with Dr. Harry Carter (St. Barnabas Med. Center). Further collaborative work was undertaken with Dr. P. Trown (Department of Chemotherapy, Hoffmann-La Roche, Inc) in studying the effect of 13-cis-retinoic acid and trans-retinoic acid on neoplastic urothelial cells in urinary bladder.

Dr. Philip Tomashefsky, together with Drs. M. Tannenbaum, B. Rivin, and F. Longo (Urology)

directed their primary emphasis on the techniques of obtaining tumor destruction by means of ultrasonic irradiation. The availability of a murine prostatic tumor has led to studies of the effect of estrogens, androgens, castration, and chemotherapy upon this entity. Dr. Meyer Melicow continued his studies on oncogenesis, particularly small cell tumors and their mechanism of metastases.

Endocrine

Dr. Ralph Richart, in collaboration with Dr. R. Neuwirth (Obstetrics & Gynecology, St. Luke's Hospital), has continued efforts to develop an out-patient female sterilization technique. Dr. Richart has continued his studies of precursors of squamous cell carcinoma of the cervix in collaboration with Dr. R. Levine (Obstetrics & Gynecology) with particular emphasis on the long-term follow-up results in patients treated on an out-patient basis with cryotherapy. Further studies of the histogenesis of the common epithelial tumors of the ovary were undertaken in collaboration with Dr. C. Fenoglio, Dr. R. Mesa-Tejada, and Dr. M. Shevchuk. The particular emphasis in recent months has been on the Brenner tumors and the endometrioid tumors.

Dr. Cecilia Fenoglio, in collaboration with Dr. M. Shevchuk and Dr. J. McDougall (Cold Spring Harbor Laboratories) has localized Herpes Simplex Virus type 2 genetic material in frozen sections of sympathetic ganglia removed from patients with leukemias and lymphomas and in biopsies from the cervix of patients with cervical intraepithelial neoplasias and invasive cancers of the cervix.

Drs. William Blanc, Carlos Navarro and Reinhardt (London) have found that chorioamnionitis in placentas from the Ivory Coast was highly correlated with maternal and neonatal hyposideremia.

Developmental Methods and System Analyses

During the past year, two new laboratories have been added to the Division of Surgical Pathology. These will perform special diagnostic services as well as functioning as research laboratories. One of these is under the direction of Dr. Daniel Knowles, whose principal effort has been to establish an immunology laboratory fully equipped to carry out a series of diagnostic and research activities on human lymphocytes. This laboratory will function as the central facility in a multidisciplinary (multidepartmental) approach to the study of lymphoproliferative disorders at the CPMC.

An immunohistology laboratory has been set up under the direction of Drs. Ricardo Mesa-Tejada and Cecilia Fenoglio. It is designed to study the histologic localization of a variety of substances by the immunoperoxidase technique of antigen localization in diagnostic material. This laboratory will analyze tissues for the presence of hormones, immunoglobulins, complement, parasites, fungi, viruses, and tumor antigens.

Dr. Thomas Blumenfeld developed and reported the results of a new, rapid and accurate method to determine fetal lung maturity using fluorescence polarization to measure the microviscosity of amniotic fluid. With Dr. R. Stark (Pediatrics) and Dr. V. Freda (Ob/Gyn), he showed that this method compares favorably to other tests for fetal lung maturity.

Dr. Michael Pesce, Director of the Special Chemistry Laboratory, has developed a micromethod for measuring plasma salicylate in capillary blood obtained by finger stick. With this procedure, salicylate levels in arthritic children can be frequently monitored without the trauma of obtaining blood by venipuncture.

Dr. John Kiyasu initiated the distribution of CPK isoenzymes in selected anatomical sites of the human heart, a comparative study of nephelometric, iodometric, chromogenic and UV methodologies for serum amylase determination, and the development of lipid profile incorporating enzymatic T4, cholesterol, triglycerides and HDL-cholesterol.

Dr. Majid Ali, in his studies with Dr. R. Mesa-Tejada, has developed an immunoperoxidase technique for the localization of IgE in nasopharyngeal tissues of patients with inhalant allergies as well as an immunoperoxidase assay for allergen-specific IgE antibodies for the *in vitro* diagnosis of atopic disorders.

Dr. Myron Tannenbaum's laboratory has had a continuing interest in the development of a clinically valid test for serum and bone marrow prostatic acid phosphatase.

Drs. Paul Ellner and Kenneth Button have started a new program to develop a system for the collection of specimens, the reporting and retrieving of data from all laboratories. New computer facilities and a Division of Laboratory Information will facilitate this process.

Patient Care

The following statistics summarize the laboratory determinations at Columbia Presbyterian Medical Center and affiliated hospitals.

	<i>Presbyterian Hospital</i>	<i>Babies Hospital</i>	<i>Sloane Pathology</i>	<i>Orthopedic Pathology</i>	<i>Neuro- Pathology</i>
Number of Deaths	1,075	140			
Number of Autopsies	244	84			
Surgicals	11,960	2,256	4,224	1,640	914
Cytology			32,945		
Clinical Chemistry	2,142,303				
Blood Bank	301,365				

	<i>Harlem</i>	<i>St. Luke's</i>	<i>Roosevelt</i>	<i>Mary Imogene Bassett</i>	<i>Overlook</i>
Deaths	908	734	554	173	577
Autopsies	169	256	182	85	152
Surgicals	5,731	10,765	9,196	25,828	11,197
Cytology	111,617	14,160	18,459	9,198	8,480
Clinical Chemistry	1,616,269	3,040,000*	833,730	374,279	1,064,504
Blood Bank	148,666	—	54,676	27,029	131,843
Microbiology	456,452	1,672,000	122,919	57,751	56,259
Hematology	301,634	1,951,000	400,471	95,991	180,975

*Refers to CAP workload units

Staff Changes

We much regret to report the death of Dr. Herbert C. Stoerk, who joined this Department in 1940. Dr. Stoerk left Columbia in 1946 to become Head of the Department of Pathology at the Merck Institute for Therapeutic Research and returned to P & S in 1961. Dr. Stoerk's incisive mind and high standards were a tremendous asset to the Department over the years, and his death is a great loss to the entire Medical Center.

On July 1, 1978, Dr. Raffaele Lattes retired as Professor of Pathology and Director of the Division of Surgical Pathology after 34 years at Columbia Presbyterian Medical Center. Dr. Lattes will continue as an active participant on a daily basis and will engage in both student and resident teaching as well as being a consultant on the Diagnostic Service. Drs. Nathan Lane and Cecilia Fenoglio have been appointed Co-Directors of the Surgical Pathology Division.

Dr. Charles Begg, after 27 years of service at St. Lukes, has retired as Director of Service and will continue to act as a consultant and participant in Departmental activities. Dr. S. Raymond Gambino was appointed Director of Laboratories at St. Luke's Hospital; Dr. John Nicholson was appointed Director of the Clinical Chemistry Laboratory; Dr. Kenneth Button was appointed Associate Director of the Clinical Chemistry Laboratory and Director of the Laboratory Information Division; Dr. Thomas

Blumenfeld was appointed Director of the Pediatric Microchemistry Laboratory.

Honors

Dr. Carmia Borek holds memberships on the Executive Council of the Tissue Culture Association, Education Committee, New York Academy of Sciences Conference Organizing Committee and has been appointed to the Editorial Board of the Journal of Environmental Pathology and Toxicology.

Dr. Thomas Blumenfeld was appointed Director of Microchemistry Laboratory of CPMC and Co-Chairman (with Dr. S.R. Gambino) of the Laboratory Section of the Task Force on Cost Containment in Medical Services of the Coordinating Council for the New York City Medical Societies and the Greater New York Hospital Association. He became a member of the Editorial Board of *LAB* (a new laboratory medicine journal), and was elected Chairman of the Staff Committee of the Medical Board of CPMC and will also serve as member of the Medical Board and representative on the Executive Committee of the Medical Board.

Dr. Jacob Furth received a medal and a prize for developing homozygous murine strain (AKR) which carry in its DNA genes of a leukemia virus and its infectious RNA copy. He also received a Fogarty Scholarship for three years effective January 1, 1980.

Dr. John Fenoglio was elected a Fellow of the American College of Cardiology.

Dr. Harry Woodson Carter was appointed Biomedical Advisor to the Annual Scanning Electron Microscopy Meeting, Washington, D.C., 1978.

Dr. A. Whitley Branwood was invited to attend the 400th anniversary of the birth of William Harvey held at the Royal College of Physicians, London, England in July, 1978.

Dr. Meyer Melicow won First Prize for pen and ink, pencil sketch: "Eerie Night—Central Park, New York"; and Third Prize for acrylic painting: "The Lantern" at the American Physicians Art Association at the AMA Convention in St. Louis, Missouri, June 17-21, 1978.

Dr. William Blanc was invited by the Royal College of Australian Pathologists to deliver a lecture and run a seminar at their annual meeting in Canberra in September. He lectured also in several hospitals in Lyding, Melkmine, Brisbane and Auckland, New Foundland and Bangkok, Thailand. He is now a Visiting Professor at the Medical School of the University of Cape Town.

Dr. Frederick Van Lente has been appointed to the editorial board of *Diagnostic Medicine*.

Dr. Karl Perzin was voted Teacher of the Year in June, 1978, by the P & S Class of 1979 for his teaching in the Surgical Pathology portion of the Third Year Surgical rotation.

Dr. Clayton Natta has become a Member of the NIH Committee on Extracorporeal Methods of Treatment of Sick Cell Anemia.

Dr. Armand Miranda was awarded the Lucy Moses Prize of 1978 for Basic Neurology.

Dr. Harold Sobel has been newly appointed to the editorial board of *Ultra-Structural Pathology*, a new journal.

Dr. Sheldon Sommers was the Walter B. Cannon lecturer, Society of Gastrointestinal Radiologists, September, 1977. He is President of the New York Pathological Society, 1977-79, won an award from the New York Academy of Gastroenterology, and was Guest Editor, Symposium on Endocrine Pathol-

ogy, for the July, 1978 issue of *Human Pathology*.

Dr. Kaity Yannopoulos, as Chairperson on the Scientific Committee, organized an annual seminar on selective problems in Surgical Pathology with Drs. R. Lattes and P. Duffy.

Dr. Bernard Wagner was appointed to the editorial boards of the *American Journal of Surgical Pathology* and the *Archives of Toxicology*. The American College of Toxicology appointed Dr. Wagner Chairman of the Committee on Pathology.

Dr. Robert Galen has been appointed medical editor of *Diagnostic Medicine*, editorial consultant to *Medical Laboratory Observer*, and consulting editor to *Clinical Laboratory Reference*. In addition, he is a member of the editorial board of *Human Pathology*. In the Fall of 1977 he was elected to the Council of Clinical Chemistry of the American Society of Clinical Pathologists and is a member of the Committee on World Standards of the World Association of Societies of Pathology (WASP).

Dr. Nicole Suci-Foca was elected member of the National Workshop Committee for HLA typing, National and International Reference Laboratory for determination of the HLA-DW5 and HLA-DW10 specificities, participating laboratory in the 8th International Histocompatibility Workshop, Immunogenetics Counsellor in the NIH site visit committee for JDM contract.

Donors

Muscular Dystrophy Foundation, United Cerebral Palsy Association, Parkinson's Disease Foundation, National Association for Retarded Citizens, National Eye Institute, NIMH, NCI, NIGMS, NIAMD, NIHLB, Ortho Research Foundation, Frank Mariani Memorial, Metpath, Sigmund Wilens Memorial, American Cancer Society, Zelda R. Weintraub Foundation, Bureau of Health Manpower, HRA, DHEW, and Community Leukemia Fund.

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Pediatrics

MICHAEL KATZ

Carpentier Professor and Chairman of the Department • Director of Service

Introduction

The Department and the Service have experienced a year of reorganization and expansion. This has been most actively noted in the Section of Ambulatory Pediatrics, which has begun a pilot project of setting up group practice modules in Vanderbilt Clinic. A prospective physical reconstruction of the Fourth Floor of Vanderbilt Clinic has called for much energy and attention of the staff.

During the Babies Hospital Alumni Association annual meeting, Dr. Katz announced the beginning of a campaign to fund a chair of pediatrics, honoring Dr. Rustin McIntosh. This campaign is now underway and approximately one third of the required \$750,000 has been collected.

Dr. Stephen J. Atwood was appointed Director of Education, replacing Dr. Martin Lorin. Dr. Atwood came to us from the Department of Pediatrics at the Albert Einstein College of Medicine.

The Hattie Alexander Lecturer this year was Dr. Robert Austrian, Professor of Research Medicine at the University of Pennsylvania, who spoke on April 14, 1978 on "Prevention of Pneumococcal Infection; Some Reflections on the Bumpy Road of Medical Science". On May 19, 1978, Dr. John C. Sinclair, Professor of Pediatrics at McMaster University the Richard Day Lecturer, spoke "On Scientific Thinking: Exploring the Architecture of Clinical Science".

Other distinguished visiting lecturers this year included Dr. Emil Gotschlich, Dr. Alejandro Zaffaroni, and Dr. Franz Joseph Schulte.

Teaching

Dr. Robert W. Winters and Dr. Ralph B. Dell have continued their seven year participation in the renal and electrolyte section of the course of Abnormal Human Biology for second year medical students.

The teaching program of the Division of Gastroenterology and Nutrition has expanded considerably over the past year. In addition to active participation in the regular departmental teaching conferences and rounds, members of the division have participated in the graduate teaching program of the Institute of Human Nutrition and in the new teaching activity, the weekly bedside gastroenterology and nutrition rounds. Two medical students from other institutions have spent time with the Division as part of the Goldberger Nutritional Fellowship Program. Members of the division participated in ten postgraduate symposia in the United States and Canada. Dr. William Heird was an invited participant in the fifth Nutricia Symposium in Rotterdam, Holland.

The Division of Growth and Development continues to cooperate with the Institute of Human Nutrition in presenting a course on Human Nutrition to the medical students. Dr. Pedro Rosso has taught in the course on perinatal nutrition for nursing students.

Dr. John F. Nicholson participated in the teaching program of the Department as attending physician and in the clinical correlation segment of the introductory biochemistry course given by the Department of Biochemistry. He also participated in the teaching

program of the Institute of Human Nutrition. In addition, he spoke on "The Genetics of Diabetes Mellitus" at the National Foundation March of Dimes Symposium on Nutrition and Genetic Diseases on November 17, 1977. As Goldberger Visiting Professor in Nutrition, he spoke on "Nutrition and Diabetes Mellitus" at the Louisiana State University School of Medicine in Shreveport. Dr. Nicholson also participated in the teaching activities of the area hospitals (Harlem Hospital, Roosevelt Hospital and Lenox Hill Hospital) and in the in-service teaching program of the Visiting Nurse Service of the New York Department of Health.

Dr. Dennis J. Allendorf of St. Luke's Hospital has repeated a Postgraduate Course in Pediatrics for pediatricians and those physicians in the area who see children.

Dr. Jerry Jacobs has held Satellite Pediatric Rheumatology Clinics at regular intervals at Harlem Hospital Center and St. Luke's Hospital.

In addition to monthly Clinical Genetics Grand Rounds and the weekly Case Reviews, the Division of Genetics has recently reinstituted weekly genetic in-patient floor rounds.

Dr. Mohamed Hafez, a Professor at Mansuura University in Egypt, spent three months here learning how to establish a clinical genetics program.

The teaching capacity of the Section of Ambulatory Pediatrics of the Division of General Pediatrics has been strengthened by the increase in staff from four to eight full-time equivalent pediatricians. This increase allows assignments of separate preceptors for housestaff and medical students in the walk-in and continuity care clinics. The teaching strength of the Division now reflects a broader range of interests derived from staff members with varied backgrounds, including private practice, developmental pediatrics, emergency medicine, and international health. Two members of the Division have appointments in the School of Public Health. The Director of Education for the Department of Pediatrics is also a member of the Division. The Division now supplies preceptors to the Pediatric Nurse Practitioner Program of the Columbia School of Nursing under coordination of Dr. Bernadette Fiscina. A training program in behavioral/developmental pediatrics will be started under a grant from the W. T. Grant Foundation.

Dr. Robert B. Mellins was appointed Director of the Cystic Fibrosis Center at Babies Hospital. This Center is now a Section of the Pediatric Pulmonary Division. Dr. Anthony L. Mansell has been appointed Director of the Pediatric Pulmonary Function Laboratory and Associate Director of the Cystic Fibrosis Center. Dr. Richard Silver was named

James Alexander Miller Fellow of the New York Lung Association. Dr. Hedi L. Leistner was named the Milton Singer Fellow of the Department of Pediatrics. Dr. S. Alex Stalcup was selected to participate in a workshop on lung cells at the C. Alton Jones Cells Science Center.

Dr. Vincent Bonagura was appointed the Rustin McIntosh Fellow and has begun training in cellular immunology under the direction of Dr. Benvenuto Pernis (Microbiology).

The Division of Hematology-Oncology has participated for the last year in a Cancer Control Program under the auspices of the Children's Cancer Study Group. The program is directed toward teaching and supervision of management of childhood malignancies. Overlook, Harlem, St. Luke's and Roosevelt Hospitals have collaborated with Babies Hospital in these activities. Dr. Michael Weiner has acted as director of the program.

The Division of Allergy has instituted weekly conferences for review of basic and clinical immunology for members of the division and part-time Allergy Clinic attendings.

With the appointment of Dr. Margaret Heagarty as the new Director of Pediatrics at the Harlem Hospital Center, plans are underway for reform and restructuring of undergraduate and postgraduate pediatric educational programs at the Hospital. The pediatric service plans to develop a residence program organized around the concept of the team or "firm." The total residency complement will be divided into three groups of residents and faculty. Each group will become responsible for a defined group of children in families for whom they will provide care in both the inpatient and outpatient setting. The fellowship program in Neonatology has become more integrated with the neonatology program at Babies Hospital with some exchange of fellows. An elective program for students and house officers is offered by the Division of Cardiology. Each year an increasing number of visiting students and residents, in addition to those from the P&S and Babies Hospital take this elective. The 1978 Mahboubian Visiting Professor was Dr. James Manning, Professor of Pediatrics at the University of Rochester. He delivered the annual lecture and attended pediatric cardiology conferences and rounds. Members of the Division continued to teach the Abnormal Human Biology course and to participate in the departmental teaching programs.

Dr. Jane Pitt was guest lecturer at postgraduate courses at University of California at San Francisco, New Jersey School of Medicine and Howard University. She gave a research seminar at New York University.

Overlook Hospital became a full member of the

Regional Perinatal Network. The cardiology Consultation Service has been expanded to provide two ambulatory evaluation and teaching sessions per month, under the direction of Drs. Welton Gersony, Sylvia Griffiths and Constance Hayes.

Research

Dr. Martin Nash has continued his work on renal excretion of phosphate in newborn dogs and with Dr. Michael Koutsoyiannis has begun a study of the effect of growth hormone on phosphate reabsorption in children. Dr. Sharon Jacobs is investigating with Dr. Nash disorders of renal function following cardiac surgery. Dr. Abraham Aviv has continued his work on compensatory growth of the kidney.

Dr. Dell and Drs. DeWitt S. Goodman and Frank R. Smith (Medicine) have continued their investigation of the kinetics of the long term turnover of plasma cholesterol data on the uptake of radioactive cholesterol in human tissues. They have employed mathematical models to determine the optimal sampling time.

Dr. Dell and Dr. Paul J. Cannon (Medicine) continued their series of experiments designed to measure regional myocardial blood flow utilizing the ^{131}I xenon washout technique and studies of methods for assessing myocardial performance utilizing a ^{201}Tl thallium in conjunction with the stress of exercise. Dr. Dell has continued his studies on the effect of the different body composition of the newborn animal on the buffer response to acute hypercapnia. Drs. Thomas Anderson, Dell and Winters have begun a study of the metabolism of intravenous fat emulsions during the course of total parenteral nutrition in infants and children by measuring total cholesterol, triglycerides, free fatty acids and the lipoprotein pattern in the patients before, during and after graded doses of the emulsions. Drs. Dell, Hymie Nossel (Medicine) and George Wilner (Pathology) have begun a collaborative effort to develop a mathematical model for fibrinogen turnover. Drs. Emi Okamoto, Anderson and Heird are continuing studies of the role of taurine in infant nutrition. Dr. Heird has continued studies of brain growth in puppies fed exclusively by the parenteral route. Dr. Janna Collins has continued studies of bile acid metabolism in patients with liver disease and has expanded these studies to include patients with cholestasis secondary to parenteral nutrition. Additional research that has been instituted over the past year includes studies by Drs. Heird and Winters of the effect of both quantity and quality of caloric intake on nitrogen retention during parenteral nutrition.

Dr. Katherine Sprunt, Ms. Grace Leidy and Ms. Winifred Redman are pursuing their studies of nor-

mal bacterial flora as host defense mechanism against infection. They have recently shown that abnormally colonized infants are at risk of infection and that implantation of a carefully selected normally occurring strain of alpha hemolytic streptococcus changes abnormal flora normal in 75% of abnormally colonized infants. They are now conducting a blind controlled experiment to determine whether abnormal flora made normal by implantation prevents infection as effectively as naturally acquired normal flora apparently does. Dr. Sprunt, Jane O'Neill and Marion Hosner have completed their initial absorption studies of the effects of chlorhexidine on skin and cord care of the newborn.

Adipose tissue development in early life and during pregnancy remains the major focus of Dr. Jo Anne Brasel's research. Dr. Myron Winick and others have continued their research on the effects of malnutrition and environmental enrichment on brain gangliosides, RNA metabolism in the brain and behavior. Dr. Pedro Rosso's major research interest remains the maternal-fetal exchange of nutrients.

Dr. John Nicholson with Drs. Nicole Suciu-Foca and Pablo Rubinstein (Pathology) extended the study of HLA association with diabetes mellitus to include associations with maturity type diabetes in early life. Drs. Collins, Jacobs, Suciu-Foca and Nicholson initiated an evaluation of HLA antigens in families of patients with arthritis and inflammatory bowel disease. In the area of metabolism, Dr. Nicholson continued his work with Drs. Winters, Heird, Anderson, Collins and Dell on patterns of plasma amino acids during total parenteral nutrition in infants. He also continued his studies of the fate of the amino nitrogen of phenylalanine in phenylketonuric subjects and he conducted clinical investigations of glycogen storage disease and of inborn disorders of intermediary metabolism simulating Reye's Syndrome. Dr. Jerry Jacobs has completed phase I of the Pediatric Rheumatology Collaborative Drug Study Group analysis of the effects of proquazone in juvenile rheumatoid arthritis; he also demonstrated that corticosteroids and aspirin are not absorbed adequately in Kawasaki's Disease.

Dr. Akira Morishima and Richard T. Henrich have completed their studies on cellular effect of marihuana and cannabinoids. Drs. Morishima, Arthur Bloom and Takayuki Nogawa continued their studies on induction of segregational errors of chromosomes by narcotics and narcotic antagonists. In collaboration with Drs. L. Stanley James and Ines Mandl, Drs. Morishima and Nogawa have continued their efforts to assess the role of elastin in the pathogenesis of respiratory distress syndrome by use of tissue culture techniques.

The Division of Genetics is continuing studies of chemical mutagenesis in human lymphocyte cultures. New studies of a reverse selection system and a metabolic activation system for pro-mutagens in lymphocyte cultures have been started. Dr. Dorothy Warburton, in collaboration with Dr. Zena Stein (Division of Epidemiology, School of Public Health) is continuing the study of spontaneous abortion. Approximately 3000 cases and 1500 matched controls have been reviewed. In collaboration with Drs. Ann Henderson and Kimball Atwood of the Department of Genetics and Human Development analysis of interchromosomal variation in rDNA content.

In the Division of General Pediatrics Dr. Fiscina is a Crosby Fellow of the W. K. Kellogg Foundation studying the design and implementation of home-based medical record for use with inner-city children. Dr. William Lupatkin is collaborating with members of the Division of Child Psychiatry in a study of psychobiological, psychopharmacological, and clinical factors of depression in prepubertal children. Dr. Nigel Paneth, in the Sergievsky Center, is studying long-term outcome of infants cared for in neonatal intensive care units.

Drs. Gabriel G. Haddad, Leistner and Mellins, in collaboration with Dr. Ralph A. Epstein (Anesthesiology), Dr. Mary Ann Farrel Epstein (Chemical Engineering) and Dr. Tze Lai (Mathematical Statistics) have pursued studies of the effect of maturation and sleep on cardiorespiratory control in normal infants and infants with abortive sudden infant death syndrome (SIDS). Dr. Epstein and Alex Zemcov (Chemical Engineering) are developing mathematical modeling of the cardiorespiratory system. Drs. Haddad and Mellins participated in a symposium on dyspnea sponsored by the American Thoracic Society. Dr. Alex Stalcup, Joel S. Lipset and Dr. Mellins, in collaboration with Drs. Gerard M. Turino (Medicine) and Lowell Greenbaum (Pharmacology) have pursued studies of the effects of hypoxia on converting enzyme activity in the dog. Drs. Stalcup, Mellins and Leila Pang (Anesthesiology) and Mr. Lipset have completed studies in the fetal rabbit on the effect of maturation on converting enzyme activity. Dr. Stalcup has developed techniques for studying endothelial cells in tissue culture in order to extend his studies of the non-respiratory functions of the lung. Drs. Silver, Stalcup and Mellins are developing new assays for the kallikrein-kinin system as part of their studies of the interaction of several different types of vasoactive chemical mediators. Dr. Mellins participated in workshops on the assessment of respiratory control sponsored by the American Thoracic Society and on pulmonary function testing in infants and children sponsored by the National Heart, Lung,

and Blood Institute.

Drs. Mansell, Daniel Cooper and Weiner have demonstrated abnormality in lung function in children with thalassemia.

The Division of Hematology-Oncology has continued to participate in all activities of the Children's Cancer Study Group, of which Dr. James Wolff, is a Principal Investigator. Dr. Wolff served as Chairman of the writing committee for protocols for intraocular unilateral and extraocular retinoblastoma utilizing adjuvant chemotherapy only and combination chemotherapy and radiotherapy, respectively. Dr. Anneliese Sitarz, as Associate Investigator, has continued an investigation of the consequences of removal of bulk tumor at the time of delayed surgery in children with neuroblastoma who are also receiving chemotherapy. For the past nine months all children with homozygous thalassemia have been treated with perfusions of subcutaneous desferrioxamine on an outpatient basis as part of a research program aimed at increasing urinary iron excretion.

Dr. Wolff, with the assistance of Dr. Ruth Tan, has begun a collaboration with Dr. Doris Wethers, in a longitudinal study of the natural history of sickle cell anemia in children. Under the auspices of Werner-Lambert/Parke Davis, Dr. Sitarz has started a trial of 2-oxo-1 pyrrolidineacetamide in patients with sickle cell anemia. Pyrrolidineacetamide is an agent that decreases the effects of hypoxia on the brain. It has been reported to reduce the number and severity of sickle cell crises.

Drs. William J. Davis, Bernard R. Feldman, Charles H. Feldman, Theodore Sher and Juan Giraldez are continuing studies of theophylline pharmacokinetics. Dr. Charles Feldman received a four year NIH contract for "Development and Evaluation of Self-Management Systems for Children with Asthma." This project will involve the pediatric allergy clinics at Roosevelt Hospital (Dr. Herbert Cohen), Harlem Hospital (Dr. Vincent Hutchinson) and St. Luke's Hospital (Drs. Irwin Polk and William Kalos) in addition to Babies Hospital.

Research in the Division of Pediatric Cardiology included a) multidisciplinary approach to basic and clinical electrophysiology involving members of the Division and Department of Pharmacology, b) nationwide cooperative study on the ductus arteriosus in the premature infant, funded by the NIH, c) a broad non-invasive investigative program of clinical pharmacology of cardioactive drugs.

Dr. Jane Pitt has been investigating the mechanisms that render certain bacteria virulent in newborn infants, and the possible role in host defense of leukocytes in human milk.

The Newborn Lung Center in the Division of

Perinatology has had four objectives a) to study factors that relate to etiology and pathogenesis of the respiratory distress syndrome (RDS), b) to develop methods of prevention, c) to improve methods of detection and treatment, and d) to evaluate the treatment by detailed follow-up of patients. During the past year significant accomplishments have been achieved in four areas:

1. Antenatal administration of betamethazone to the mother was found to be associated with better survival from RDS (Dr. James and Mr. Henry Rey).
2. The administration of sodium bicarbonate to the neonate did not increase the incidence of intraventricular hemorrhage (Drs. Adrian Moessinger and John Driscoll).
3. Lung cells in culture produced elastin tissue (Drs. Morishima and Dr. Ines Mandl of the Department of Obstetrics and Gynecology).

Dr. Karl Schulze's research is concerned with determining factors relating to improved survival of the low birth weight infant. He has characterized the metabolic behavior of sick infants, and has developed and validated complex electronic instrumentation capable of measuring continuously minute by minute oxygen and CO₂ exchanges. Dr. Joan Regan has studied infant and maternal colonization with Group B streptococci. She has defined three risk factors predisposing to colonization: unregistered status, premature rupture of membranes and maternal blood group B. Dr. Tove Rosen is continuing her studies on the short and long-term effects of methadone on the somatic and neurobehavioral development of infants born to mothers on methadone therapy. In conjunction with Dr. Michael Rosen she is also conducting studies in the hypertensive rat of the maternal, fetal and neonatal effects of chronic propranolol administration during pregnancy.

A contract was awarded through the National Heart, Lung and Blood Institute to study sickle cell disease at Columbia-Presbyterian Medical Center, Harlem Hospital and St. Luke's Hospital Center. Newborns with sickle cell disease identified through the New York State Newborn Screening Program will be entered in December; other patients will be entered in March, 1979. Comprehensive, standardized data on all events in the life of children with sickle cell disease will then be collected. Principal Investigator for the study will be Dr. Doris L. Wethers.

Dr. Barbara Dangman, Director of the Division of Neonatology at Harlem Hospital has begun a collaborative effort with Drs. Winters and Heird to investigate the nutrition of premature infants.

Dr. Eric J. Kahn has recently returned from a 6

month sabbatical leave during which he continued his studies of obesity in childhood.

Dr. Barbara Barlow in collaboration with the Division of Genetics has embarked on a study of the genetics of polydactylism.

Patient Care

The Section of Nephrology continues to participate in the International Collaborative Study of Kidney Disease in children which includes 25 clinics around the world involved in the treatment of a variety of kidney diseases. There are currently four children on hemodialysis awaiting renal transplantation and one child received a kidney transplant during 1978.

The role of the Division of Gastroenterology in patient care, as in the past, continues to be primarily consultative with approximately five new gastroenterology and/or nutrition consultations being provided weekly. The number of procedures performed has increased tremendously: during the past year 80 upper intestinal endoscopies, 50 proctoscopies, 25 jejunal biopsies and 40 liver biopsies have been performed.

There were 256 out-patient visits in the Genetics Clinic and approximately 125 in the satellite clinics at Harlem and St. Luke's Hospitals. In addition, there were an average of two in-patient consultations per week at Babies Hospital. Laboratory studies included amniotic fluid cell analyses, peripheral blood chromosome studies and bone marrow studies, done by Dr. Warburton and her staff. The Genetic Clinic staff at Babies Hospital has recently begun counseling for sickle cell trait or disease in families whenever these abnormalities have been identified in the newborn. A psychiatrist has been added to the Genetics staff who provides support to patients and parents under emotional stress, both acute and chronic, when genetic disease is present or threatening.

The Genetics Diagnostic Laboratory, under the direction of Dr. Warburton, performed chromosome studies on approximately 350 peripheral blood specimens, 85 bone marrows and 300 amniotic fluid samples.

The Pediatric Clinic has had 66,236 visits of which 12,056 were specialty clinic visits. In association with the Division of Ambulatory Obstetrics and Gynecology, the Division of General Pediatrics has been awarded a federally funded WIC (Women, Infants, and Children) Program, allowing assistance to community children in meeting their nutritional needs.

A General Pediatric Group Practice (GPGP), staffed by faculty from the Division, has begun provision of efficient, comprehensive primary care on a

continuing basis to community children. The pica clinic has been integrated into the GPGP under the direction of Dr. Fiscina. Plans have been completed for renovation of the fourth floor of Vanderbilt Clinic into a Women's and Children's Center focusing on primary care and preventive medicine.

The Pediatric Pulmonary Division was given the responsibility for directing all cystic fibrosis activities at Babies Hospital. Ms. Angie Paniagua was named clinical coordinator and Ms. Jane Andersen (Associate in Nursing) was appointed Nurse Clinician for the group.

The Pediatric Pulmonary Division is currently following 88 patients with cystic fibrosis and 150 patients with other forms of respiratory disease. These patients have required 109 hospital admissions in the past year.

Two hundred and eighty admissions for status asthmaticus and 4,000 ambulatory visits for asthma and related allergic problems were recorded during the year.

Pediatric Cardiac Clinic had a caseload of 1256 patients: 980 with congenital heart disease, 175 with a history of rheumatic fever of rheumatic heart disease and 101 with miscellaneous diagnoses (arrhythmias, anemia, etc.). The clinic population now extends in age through adolescence and early adult life, offering a unique opportunity for long term observation of natural history of patients with congenital defects, both with and without surgical treatment. There are approximately 2,500 outpatient visits yearly. The average daily census in the combined cardiac surgery-pediatric cardiology services is 25. There were 270 cardiac operations and 320 catheterizations.

Dr. Pitt instituted a consultation service for children with recurrent infection and undertook an evaluation of pneumococcal and Hemophilus influenzae vaccines in patients without spleens or with sickle cell anemia.

The development of regionalization has focused increased attention on neonatal intensive care units (NICU's) and their central role in newborn care. In recognition of this important role, the Perinatal Network has been an active participant in the planning and implementation of programs to help the NICU's in the region coordinate their services and meet the new demands of regionalization.

The Network has been actively involved in the documentation of the need for additional staff at all levels of NICU operations, the development of an adequately staffed, equipped and financed transport system, careful monitoring of all factors influencing occupancy rates (including the use of other pediatric ICU's both within the tertiary center and at other

Network hospitals) and detailed projections and analyses of the finances of the NICU.

Dr. James and his staff have completed the evaluation of the transcutaneous PO₂ electrode and it is now being used clinically to assess by non-invasive methods the oxygenation of the very sick infant.

At St. Luke's Hospital the Child Abuse/Neglect Committee chaired by Dr. Elizabeth B. Watkins received a grant of \$10,000 from the Riverside Church Benevolence Committee for preventive work. This permitted establishment of a small pediatric outreach home visitor program.

A WIC food supplement and nutrition education program began at St. Luke's Hospital in September, 1978 and has initial approval for 400 participants.

At Overlook Hospital a consultative clinic for pediatric endocrinology was started by Dr. Morishima.

The Birth Defects and Genetics Disease Center at St. Mary's Hospital in Bayside has been strengthened during 1978, with a steady state 20-bed in-patient occupancy.

The comprehensive care residential treatment program for asthmatic children at St. Mary's Hospital in Queens under the direction of Dr. Charles Feldman has been filled to capacity for the entire year and has expanded to a 25 bed unit.

Several programs are in the process of development at Harlem Hospital. An adolescent clinic now meets one evening a week and a second half day/clinic will be opened shortly. In addition a 12 bed adolescent inpatient service has been instituted. A defined program for pre-operative teaching of parents and children scheduled for surgery has started. All children scheduled for surgery are invited to come to the Center a few days before admission for a general discussion of the hospital and surgical routines. A tour of the facilities is also included.

The out-patient department of the Mary Imogene Bassett Hospital has approximately 14,000 out-patient visits this year.

National Societies, Honors, Awards and Activities

Dr. Nicholson was appointed Director of Clinical Chemistry Service and Coordinator of Chemistry Laboratories. He served as Director of the Children's Diabetic Clinic and served on the Curriculum Committee of the College of Physicians and Surgeons and on its Subcommittee for Evaluation. In the Department of Pediatrics, Dr. Nicholson served as Chairman of the Clinical Laboratories Committee and of the Human Investigations Committee, and was a member of the Executive Committee and Internship Selection Committee of the Department of Pediatrics.

Dr. Jerry Jacobs was Visiting Professor at the State University of New York at Buffalo and presented his studies before the American Academy of Pediatrics, the American Pediatric Society, The New York Heart Association and the New York Academy of Medicine. He took part in courses on "The Child with Connective Tissue Disease" at the Albert Einstein College of Medicine and "Rehabilitation in Arthritis and Related Disorders" at the Mount Sinai School of Medicine. He also served on the Arthritis Ad-Hoc Advisory Group at the National Institutes of Health.

Dr. Akira Morishima was appointed as a Consultant at Overlook Hospital. Dr. Jennifer Bell was appointed as member of the Medical Advisory Board of the National Pituitary Agency.

During 1978, Dr. Bloom was instrumental in forming a New York State Genetics Grant Executive Committee, and was subsequently elected Chairman. The Committee developed an application for funds for genetic testing and counseling on a State-wide level, with virtually all genetics units in the State working cooperatively. This effort has been funded by the Health Services Administration. Dr. Bloom continues as Chairman of the City-wide Task Force on Genetics.

Dr. Brasel was elected president of the Society for Pediatric research and to membership on the American Institute of Nutrition Nominating Committee. She also serves as the Endocrine Society representative to the Council of Academic Societies of the Association of American Medical Colleges. Dr. Winick was the AMA Joseph Goldberger Visiting Professor in Clinical Nutrition at the University of Minnesota in February, 1978 and was appointed Scientific Chairman of the National Maternal and Infant Malnutrition Conference sponsored by the President's Commission on Retardation and the National Foundation/March of Dimes in March, 1978. Dr. Rosso was selected to chair a scientific session at the XIth International Congress of Nutrition in Rio de Janeiro and was an invited speaker at the conference for UNICEF leaders at the Harvard School of Public Health. Dr. Rosso also was appointed to the Nutrition Study Section of the National Institutes of Health for a four year term beginning in 1979. Drs. Katz, Brasel and Winick made presentations at the Special Symposium on Semi-Starvation sponsored by the Institute of Human Nutrition and also participated in the Pediatric Postgraduate Course sponsored by Babies Hospital. Drs. Brasel, Winick and Rosso participated in symposia at the annual Academy of Pediatric Meetings. In addition Dr. Brasel was invited speaker at a symposium held by the Nutrition Institute of Colorado State University and was one of

the plenary speakers at the meetings of Midwestern Society for Pediatric Research. Dr. Brasel has begun her term as President of the Society for Pediatric Research. Dr. Katz was appointed consultant to the World Health Organization Eastern Mediterranean Regional Office in Alexandria, Egypt, to help with the activities of the UN International Year of the Child.

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Pharmacology

BRIAN F. HOFFMAN

Hosack Professor and Chairman of the Department

Teaching

The Department made several new provisions for the instruction of medical and dental students in pharmacology. It completed renovation of a new teaching center which includes office space for the Course Director, a student conference room and several computer terminals for student use. Also, the courses for medical students were modified to accommodate the new second year curriculum. The changes include added emphasis on several topics of increasing importance, the development of a new series of two-hour exercises in Rational Therapeutics and further revision of the pharmacology syllabus. The course will continue to increase its emphasis on small group teaching to permit more effective interaction between students and faculty as well as afternoon exercises that include course conferences, computer-assisted instruction, analogue tape recordings of demonstrations of the actions of selected pharmacologic agents and laboratory experiments that require the students to solve pharmacological and therapeutic problems. In addition, in an attempt to provide the dental students with course offerings suitable to their field, the department continued to present a number of separate lectures and afternoon exercises designed to meet the unique requirements of this group.

Dr. Katz taught a course in Interactive Computer Graphics in the Department of Civil Engineering and Engineering Mechanics. He also lectured on computer assisted Pharmacokinetics in the Pharmacology Course.

The department admitted four new Ph.D. candidates to the Pharmacological Sciences Training Program. They are John Aletta, Sharon Avrutin, Barbara Hisler and Linda Kupfer. Charles Stier, Hrayr Karagueuzian, Eric Spokas, David Larach and Carl Rasmussen completed pre-doctoral training and were granted the Ph.D. Degree in Pharmacology. Dr. Stier currently is a post-doctoral fellow at the College of Medicine, University of North Carolina. Dr. Karagueuzian is a post-doctoral fellow at the Laboratoire de Physiologie Comparee, Universite de Paris-Sud, Centre Universitaire, Orsay, France and Dr. Spokas holds a similar position in the Department of Pharmacology at the University of Tennessee. Dr. Rasmussen, who also received the M.D. Degree, is currently a resident in medicine at the University of Chicago. Dr. Larach is completing his medical studies at The College of Physicians and Surgeons. Drs. Robert Naylor and Christine Walsh began their postdoctoral training with Dr. Brian F. Hoffman and Dr. William Unterecker and Dr. Y.H. Lau with Dr. Michael R. Rosen. Drs. Robert Reder, Robert Hariman and Kenneth Dangman continued a second year of post-doctoral training. Currently 16 students are in residence as candidates for the Ph.D. Degree.

During the year the Department participated in a Basic Medical Sciences Review Course for U.S. citizens studying in foreign medical schools, in collaboration with the Department of Pathology.

A number of former trainees accepted positions at other schools. Dr. John Robinson was appointed Assistant Professor Physiology and Pharmacology at

Bowman Gray Medical School. Dr. Peter Temesy-Armos was appointed Assistant Professor of Medicine at The Medical College of Ohio and Dr. Martin Wallenstein accepted a position as Assistant Professor in the department of Physiology of The New York University School of Medicine. Dr. Barry Sandrew joined the Department of Physiology at The Harvard Medical School.

Recipients of the annual Herbert J. Bartelstone Award were Ms. Jane Solmon of the medical class and Mr. Harry Dym of the dental class.

Dr. Solomon Snyder, Distinguished Service Professor of Psychiatry and Pharmacology at The Johns Hopkins School of Medicine, gave the H.B. van Dyke lecture on "Neuro-transmitter Receptors in the Brain."

Research

Dr. Andrew L. Wit, Dr. John Fenoglio (Pathology), Dr. T.D. Pham (Pathology) and their associates have continued to study the electrophysiology and pharmacology of post-infarction arrhythmias. With Dr. Hrayr Karagueuzian they developed a model of ventricular tachycardia following myocardial infarction and have characterized the electrophysiology of this type of post-infarction arrhythmia. Dr. Wit and Penelope Boyden (graduate student) are determining the effects of naturally occurring heart disease in animals on the electrophysiology of the heart and, with Dr. Fenoglio, are identifying the associated structural changes. This work is being conducted in association with Dr. Lawrence Tilley (Staff Cardiologist at the Animal Medical Center). Drs. Wit, Fenoglio and Pham continued to study the ultrastructure of human atrial myocardium from children with congenital heart disease in collaboration with Drs. M.R. Rosen and Alan Hordof (Pediatrics).

With Eric Spokas, (graduate student) Dr. H.H. Wang explored the mechanisms through which the antihypertensive drug, hydralazine, increases plasma renin activity. With David Larach (M.D.-Ph.D. candidate) and Dr. Marvin R. Blumenthal, she has developed a comprehensive method to study the effects of vasoactive drugs on intravascular volume in regional vascular beds. Mr. Larach wrote a complete computer program for this study. Dr. Wang also has continued the study of newer prostaglandins and related compounds with Dr. K.E. Eakins and Dr. P.S. Kulkarni (Ophthalmology). They have found age-dependent differences in the action and interactions of prostacyclin and thromboxane A_2 on the canine coronary vascular bed.

Dr. Douglas N. Ishii has continued his studies on

the mechanism of morphological and biochemical differentiation in cultured neuronal cells. He found that morphological differentiation in response to nerve growth factor could be reversibly inhibited by tumor promoters in explants of embryonic chick sensory and sympathetic ganglia. Together with Drs. Virginia M. Tennyson (Anatomy) and E.M. Masurovsky, Dr. Ishii is studying the effects of tumor promoters on the fine structure of embryonic sensory ganglia. In the search for agonists other than nerve growth factor, Drs. Ishii and George M. Maniatis (Univ. of Patras Medical School) have found that structural analogs of hemin can reversibly induce neurite outgrowth in cultured sympathetic ganglia and in neuroblastoma cells. Currently, Dr. Ishii is studying the effects of agonists such as hemin on the binding of iodinated nerve growth factor to cultured neuroblastoma and pheochromocytoma cells. His evidence suggests that small ligands, such as hemin, can induce differentiation through interaction with cell surface receptors.

Dr. Jaya Haldar continued her research on the action of morphine on vasopressin and oxytocin release both *in vivo* and *in vitro*. She also is investigating whether endogenous opioid peptides, particularly endorphin, have any role in oxytocin release under physiological conditions and during stress. During the year Dr. Haldar started a collaborative project with Dr. Earl Zimmerman (Neurology) to explore the possible physiological functions of extrahypothalamic oxytocin.

Dr. Wilbur H. Sawyer and Dr. Haldar continued their collaboration with Dr. Maurice Manning (Medical College of Ohio) on the design of more effective and specific synthetic peptides that antagonize the actions of vasopressin and oxytocin. Peter Mento (graduate student), Dr. H.H. Wang and Dr. Sawyer are using such peptides to investigate the importance of vasopressin in rat models of hypertension. Dr. P.K.T. Pang (Texas Tech School of Medicine) and Dr. Sawyer continue to collaborate on studies of the evaluation of cardiovascular and renal responses by non-mammalian vertebrates to their native neurohypophysial hormones. Dr. Pang has been exploiting doubly-perfused amphibian and lungfish kidneys to separate and define the glomerular and tubular components of renal responses. Dr. Sawyer has concentrated on development of sensitive and reliable radioimmunochemical measurement of arginine-vasotocin in small samples of fish plasma. Dr. Charles Stier and Dr. Sawyer completed studies on the action of specific natriuretic analogs of oxytocin on the rat kidney and on the relations of molecular structure to natriuretic activity.

Dr. S.C. Wang, with Drs. Barry B. Sandrew and

Robert C.C. Yang, Jr. completed a study on the efficacy of electro-acupuncture in the monkey. They found in behavioral studies that the pain threshold is increased and, in the immobilized monkeys, nociceptive impulses in the *N. parafascicularis* of the thalamus are blocked. Dr. Martin C. Wallenstein, in collaboration with Dr. Wang, found that morphine activates the N. Edinger Westphal in the cat midbrain to produce miosis. However, morphine also stimulates the adrenal medulla to release epinephrine, which in turn causes mydriasis. Dr. J.N. Sharma, working with Drs. Sandrew and Wang, demonstrated conclusively by use of iontophoretic techniques that the antihypertensive agents clonidine, propranolol and α -methyldopa act on the bulbar cardiovascular neurons by inhibiting their spontaneous activity. Dr. Wang, working with Dr. John H. Robinson, investigated the spontaneous neuronal activity of the hippocampus, septum and hypothalamus (limbic system) and found that morphine stimulated the activity of these neurons and diazepam blocks this action. Dr. H.K. Lee (National Defense Medical Center-Taiwan) and Dr. S.C. Wang have completed a study on penfluridol and its antiemetic action.

Dr. Richard Robinson established a new laboratory for electrophysiological and pharmacological studies on cardiac cells in culture. Experiments were conducted to measure the effect of alpha and beta adrenergic agonists on the spontaneous rhythm of the cultured cells and to determine, in collaboration with Dr. John Bilezikian (Medicine) and Dr. Y.H. Lau, the beta receptor density by means of radioactive binding assay. Work was begun to produce co-cultures of cardiac and neural cells in order to examine the effect of *in vitro* innervation on the response of the muscle cells to adrenergic agonists and on the density of the beta receptors.

In collaboration with Drs. K. Nishitaten, A.D. Finck and B.A. Berkowitz (Roche Institute of Molecular Biology) Dr. S.H. Ngai completed a study in pharmacokinetics of morphine and effects of hypocarbia in dogs. With Dr. Finck, and Drs. M. Kantzler and Jerome H. Jaffe (New York State Psychiatric Institute), Dr. Ngai studied the behavioral effects of nitrous oxide in man. Nitrous oxide (33 percent) increases the LSD Subscale of the Addiction Research Center Inventory and decreases psychomotor performance. Naloxone pretreatment does not reverse these changes. In collaboration with Dr. D. L. Cheney (Laboratory of Preclinical Pharmacology, NIMH) he studied the effects of lidocaine and cocaine on behavior and acetylcholine turnover rates in brain structures in rats. Sedation induced by lidocaine is associated with a decrease in the acetylcholine turnover rate in the cerebral cortex. In con-

trast, cocaine markedly increases motility together with sympathomimetic manifestations and this is associated with increased acetylcholine turnover rates in the cerebral cortex and the diencephalon.

Dr. J. Thomas Bigger and Dr. Elsa-Grace V. Giardina (Medicine) continued pharmacogenetic studies of procainamide acetylation and the correlation between acetylation phenotype and immunotoxicity. With Dr. Frank I. Marcus (University of Arizona), they studied the efficacy, kinetics and toxicity of a slow release formulation of procainamide in 40 patients. With Dr. Alexander H. Glassman (Psychiatry) and Dr. James M. Perel (Psychiatry), Drs. Giardina and Bigger studied the effects of imipramine and desipramine on blood pressure, left ventricular performance and cardiovascular reflexes in depressed patients. In these studies high plasma concentrations of hydroxylated metabolite were found. Drs. Francis M. Weld (Medicine), Lau, Bigger and David A. Rubin (Medicine) are studying the electrophysiological effects of imipramine and 2-OH-imipramine on cardiac Purkinje fibers. Having discovered that imipramine has antiarrhythmic properties in depressed patients, Drs. Giardina, Bigger and Perel are beginning a study of its antiarrhythmic effects and metabolism kinetics in cardiac patients. Drs. Edward B. Leahey (Medicine), James A. Reiffel (Medicine), Vincent P. Butler, Jr. (Medicine) and Bigger studied a drug interaction between digoxin and quinidine; kinetic studies in patients and animal models and receptor binding studies in human erythrocytes are in progress. Drs. Leahey, Giardina, Perel and Bigger are studying the metabolism, kinetics and efficacy of mexiletine in human subjects with ventricular arrhythmias. Dr. Carl A. Rasmussen, Jr., (Ph.D. candidate), Dr. Bigger and Dr. Weld completed a voltage clamp study of the calcium ion on normal automatic behavior in cardiac Purkinje fibers.

During the year Dr. Harold C. Neu has studied the antimicrobial activity of a number of novel cephalosporin and penicillin agents. Resistance of these compounds to inactivating β -lactamases has been evaluated and progress made in establishing the relative relations of bacterial cell entry and β -lactamase resistance upon antimicrobial activity. Dr. Neu also studied the human pharmacology of several new penicillins and cephalosporins in normal subjects and those with depressed renal function. Comparative studies on the pharmacokinetics of these agents have been conducted with Drs. Kwung P. Fu and Stephen J. Pancoast (Medicine). Dr. Neu also studied the effects of antimicrobial agents on human fecal flora and the development of resistant bacteria as well as the transport of agents into vaginal secretions in young women with urinary infections.

Dr. Michael R. Rosen and his associates have continued their studies on developmental cardiac electrophysiology and pharmacology and on the electrical activity in the human heart. Drs. Mary-Rabine (Universite de Liege, Belgium) and Rosen evaluated the effects of lidocaine on the electrophysiologic properties of neonatal and adult canine cardiac Purkinje fibers and Drs. Rosen, Robert Roder, Peter Danilo and Alan Hordof (Pediatrics) studied age-related changes in the contribution of Ca^{++} to the cardiac action potential plateau. Dr. Rosen with Drs. Mary-Rabine, Danilo and Hordof studied the contribution of α and β adrenergic receptor activation to the control of heart rate in neonatal and adult canine cardiac Purkinje fibers and in dogs with complete heart block. Dr. Rosen has continued his studies on isolated preparations of human atrium in collaboration with Drs. Mary-Rabine, Hordof (Pediatrics), Spotnitz, Malm, Edie and Bowman (Surgery). They extended their studies of α and β adrenergic effects to human atrium and determined that for pacemakers outside the sinus node there are both α (inhibitory) and β (excitatory) effects on automaticity. Drs. Danilo, Vulliemoz, (Anesthesiology) Verosky, (Anesthesia) and Rosen evaluated the relationship between epinephrine-induced changes in automaticity to its effect on the adenylate cyclase-cAMP system. Dr. Dennis Miura (Peter Bent Brigham Hospital) and Rosen reported the effects of digitalis on intracellular extracellular K^+ activity of cardiac Purkinje fibers and quantified the changes that occur in both variables as digitalis exerts its toxic effects.

During the year Dr. Brian F. Hoffman and Dr. Kenneth H. Dangman studied the effects of N-acetylprocainamide on the electrical activity of isolated cardiac fibers and on the *in situ* canine heart. This agent, the primary metabolite of procaineamide in humans, exerts actions quite different from those of the parent compound. Drs. Dangman and Hoffman also investigated the effects of antiarrhythmic drugs on abnormal mechanisms for impulse initiation in cardiac Purkinje fibers and demonstrated consistent differences in drug sensitivity of normal and abnormal automatic mechanisms. Dr. Robert I. Hariman and Marvin E. Cramer (Medicine) and Dr. Hoffman continued studies on the electrical activity of the sinoatrial node in canine and human hearts. They developed a method to record sinus node activity through a unipolar electrogram and with Dr. Ehud Krongrad (Pediatrics) have used this method to evaluate pacemaker activity in the hearts of pediatric patients; also, with Drs. James R. Malm, Frederick F. Bowman and Richard N. Edie (Surgery) they have applied similar methods to study sinus node activity

during cardiac surgical procedures. With Dr. Christine Walsh, a postdoctoral trainee, Drs. Hoffman and Rosen have begun a study on the ventricular arrhythmias that occur after release of transient occlusion of a coronary artery. Drs. Dangman and Hoffman have continued their studies on ethmozine, a promising antiarrhythmic drug initially developed in the Soviet Union.

Dr. Greenbaum, Dr. S. Roffman and Ms. Gloria Semente continue their investigation on drugs which retard ascites fluid formation resulting from neoplastic disease. Drs. Greenbaum and Roffman and Ms. Semente also continue their collaboration with Dr. Gerard Turino (Medicine) in studies on vasoactive mediators in lung injury.

Dr. Simpson is continuing his research in two areas: the effects of psychoactive drugs on the autonomic nervous system and the effects of neurotoxins on the voluntary nervous system. This work has contributed to an understanding of the mechanisms by which nerve fibers release their transmitter substances.

Activities

Dr. Shih-Chun Wang, Gustavus A. Pfeiffer Professor of Pharmacology, retired after serving for thirty-eight years as a member of the Faculty of the College of Physicians and Surgeons, first in the Department of Physiology and, since 1956 as a Professor of Pharmacology. Dr. Shih-Chun Wang was born in Tientsin, China in 1910. He was granted the B.Sc. Degree by Yenching University and the M.D. by Peking Union Medical School in 1935. He turned immediately to research and spent two years in collaboration with Dr. Robert K.S. Lim. He then was awarded a Fellowship by the Rockefeller Foundation to study physiology at Northwestern University with the late Professor S.W. Ranson. He was granted the Ph.D. Degree by Northwestern in 1940 and in the same year joined the Department of Physiology at the College of Physicians and Surgeons. He was appointed Professor of Pharmacology in 1956 and was named the first Pfeiffer Professor of Pharmacology in 1975. In honor of his retirement, his former students organized a Symposium on Brainstem Mechanisms. The proceedings of this Symposium will be published as a *liber memorialis*. On his retirement Dr. S.C. Wang was appointed Professor Emeritus.

During the year two members of the Department were on sabbatical leave. Dr. Kahn spent a six month sabbatical leave at U.C.L.A. He visited many western medical schools to study how different institutions make curriculum decisions. In addition, he interviewed the Clinical Professor of Dentistry at two

dental schools, as part of an ongoing study, to determine their use of drugs in dental practice. Dr. Wit spent six months at The Rockefeller University working with Dr. Paul Cranefield and six months at the Rijksuniversiteit Limburg, Dept. of Physiology, Maastricht, The Netherlands, working with Professor Felix Bonke. Dr. Roberto Levi, Professor Pharmacology at Cornell, spent six months as Visiting Professor with the Department working with Dr. Rosen on the effects of histamine on cardiac tissues. Drs. Peter Pang, Visiting Associate Professor and Rosemary Pang, Visiting Research Associate from the Texas Tech School of Medicine, spent three months collaborating with Dr. Sawyer in his research. Dr. Jon-Son Kuo, Visiting Assistant Professor from The National Defense Medical Center in Taiwan, spent six months collaborating in research with Dr. S.C. Wang.

Dr. Wilbur H. Sawyer was named Gustavus A. Pfeiffer Professor of Pharmacology. Dr. Sawyer and Dr. Pang were invited speakers at a symposium on epithelial transport in lower vertebrates held at Villefranche-sur-mer, France, honoring their late colleague, Dr. Jean Maetz. Dr. Sawyer served on an *ad hoc* Cardiovascular and Renal Study Section for the National Institute of Health and continues as a member of the Editorial Boards of the *Proceedings of the Society for Experimental Biology and Medicine* and *Physiological Zoology*.

Dr. Greenbaum continues to serve on the University Senate, as a member of its Executive Committee, as Director of Graduate Studies in the Department, as Director of the University M.D.-Ph.D. Program and as Chairman of the Public Affairs Committee of the American Society for Pharmacology and Experimental Therapeutics. Dr. Greenbaum participated in the International Congress on Kinins held in Tokyo, Japan. He also was invited to present the "Overview on Kinins" at the annual meeting of the Federated Societies for Experimental Biology.

Dr. Rosen continues as Associate Editor of *Circulation Research* and as a member of the Cardiovascular-Pulmonary Study Section of the National Heart, Lung and Blood Institute. In addition, he was appointed a member of the New York Heart Association's Council on Professional Education and was elected to the Board of Regents of the American College of Clinical Pharmacology. He continues to serve as a Career Scientist of the Irma T. Hirsch Trust.

Dr. Kahn continued to serve as Course Director for the medical and dental student courses and as a member of the Curriculum Committee. He also serves as consulting pharmacologist to the Pharmacy

and Therapeutics Committee of Harlem Hospital.

Dr. Neu was a member of the Scientific Program Committee of the International Conference on Antimicrobial Agents and Chemotherapy and chaired the Symposia on Preventive Agents. He was a visiting Professor in Japan, Italy and Austria, where he lectured on anti-bacterial drug resistance and the pharmacokinetics of antimicrobial agents. He serves on the Editorial Boards of *Antimicrobial Agents and Chemotherapy*, *The American Journal of Medicine*, *The Journal of Clinical Microbiology*, *Drugs*, and he joined the Editorial Board of the *Journal of Antimicrobial Chemotherapy*.

Dr. Bigger continued to serve on the Editorial Boards of *Stroke* and the *Journal of Pharmacology and Experimental Therapeutics*. Dr. Bigger was an invited speaker at the International Congress of Anesthesiology in Paris, and a Visiting Speaker at the International Computers in Cardiology Meeting in Stanford, California. Dr. Bigger continues as a Director of the New York Heart Association. Dr. Frederick G. Hofmann continued to serve as Associate Dean for Admissions, P&S. Dr. Brian F. Hoffman continued to serve on the Executive Committee of the Faculty Council, as Editor of *Circulation Research* and as Adjunct Professor in the Rockefeller University and as President of the New York Heart Association.

Dr. Douglas N. Ishii was a recipient of a Research Career Development Award from The National Institute of Neurological Communicative Disorders and Stroke and Dr. Daniel Goldberg was appointed a Career Scientist of The Irma T. Hirsch Trust. Dr. Richard Robinson was awarded an Investigatorship from the New York Heart Association and was a co-author of an invited paper at the Third International Symposium on Vascular Neuroeffector Mechanisms, in Belgium.

Dr. Lou Katz was a member of The Organizational Committee for USENIX, The UNIX Computer System users group. He also lectured at The University Seminar on "Computers and Society." Dr. H.H. Wang was appointed to The Editorial Board of *Circulation Research*. Dr. S.H. Ngai served as Visiting Professor at the University of California, Los Angeles and at The University of Miami. During the year he was given the 1978 Achievement Award of The American Chinese Medical Society. He continues as a consultant to The Surgery, Anesthesiology and Trauma Study Section of The Division of Research Grants, NIH and as a member of the Editorial Board of *Neuropharmacology*. Dr. Edward B. Kirton was appointed Director of Clinical Pharmacology at Knoll Pharmaceuticals.

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Physiology

JOHN V. TAGGART

Dalton Professor and Chairman of the Department

Teaching

Drs. John Martin and Gerardo Bilotto completed the requirements for the Ph.D. degree and began postdoctoral training, Dr. Martin at P & S and Dr. Bilotto at Rockefeller University. Eighteen post-doctoral fellows and visiting scientists participated in the department's research activities. There were fourteen candidates for the Ph.D. in residence, and four medical and dental students were engaged in elective research.

Research

Dr. Shu Chien and his colleagues in the Division of Circulatory Physiology and Biophysics have continued their interdisciplinary research programs on "Blood Cell Membranes in Health and Disease" and "Rheological Factors in Macromolecular Transport Across Arterial Wall." Investigations are in progress on viscoelastic properties of erythrocytes and leukocytes, force balance in cell interactions, and the role of blood cell properties on circulatory dynamics *in vivo*. Kwo-Li Paul Sung, Langping Amy Sung and Dr. Chien have studied the viscoelastic properties of erythrocyte membranes by the use of micropipettes and the flow channel. The results have been correlated with ultrastructural investigations performed by Dr. Mary M.L. Lee (Pathology) and cytochemical research carried out by Drs. David Schachter and Richard Abbott. Dr. Shunichi Usami has studied the

geometry of erythrocytes by the use of microscopic image holographic technique. Studies have been performed on the influences of complement coating with Dr. John Freedman (St. Michael's Hospital in Toronto) and blood group antibodies with Dr. Elvin A. Kabat (Microbiology and Human Genetics and Development) on red cell membrane deformability. Dr. Richard Y.Z. Chen (Anesthesiology) and Dr. Lee have investigated the deformability and shape changes of erythrocytes in the presence of local anesthetics. Paul Sung and Dr. Geert W. Schmid-Schönbein have investigated and viscoelastic properties of leukocytes. Dr. Schmid-Schönbein has studied the detailed morphology of leukocytes by light microscopy and electron microscopy, with the aid of stereological method. The rheological and morphological data on erythrocytes and leukocytes have been correlated with theoretical studies performed by Drs. Richard Skalak, George B. Schuessler, and Husnu Tozeren at the Department of Civil Engineering and Engineering Mechanics and by Dr. Aydin Tozeren (Visiting Scientist from the Medical East Technology University, Turkey). Robert G. King, Dr. A. Ann Kaperonis, and Dr. Chien have investigated the quantitative effect of controlled deoxygenation on the viscoelastic properties of concentrated sickle hemoglobin solutions and concentrated sickle cell suspensions, and these experimental studies have been performed in parallel with theoretical computations by Drs. Schuessler, Skalak and T.

Tozeren. Dr. Kung-Ming Jan and Dr. Dean A. Handley have employed the freeze fracture technique to investigate the effects of antibodies and lectins on the distribution of intramembranous protein particles. Drs. Jan and Chien have continued their research on the roles of macromolecular bridging energy, electrostatic repulsive energy, mechanical shear stress, and membrane bending energy on red cell aggregation by dextrans and heparin. With the use of ^{133}Xe washout method, Dr. Chen has compared the cerebral blood flows determined by extracorporeal counting and by sagittal sinus sampling. Drs. Foun-Chung Fan (Anesthesiology), Chen and Schuessler have compared the cerebral blood flow measurements obtained by the use of ^{133}Xe washout and microsphere techniques. They have investigated the shunting of 9μ and 15μ microspheres through various regions of the circulation and used the microsphere method to study the effects of hematocrit variations on regional blood flow distribution. Marc Levin (medical student) has studied the blood flow through the *vasa vasorum* of aorta, arteries and veins by the use of the microsphere technique. Dr. Jan has determined the effect of hematocrit variations on coronary blood flow and oxygen utilization after hemorrhage. Dr. Herbert H. Lipowsky and Dr. Usami have investigated microcirculatory dynamics in the mesenteric circulation by simultaneous measurements of pressure gradient, flow velocity, vessel diameter and red cell concentration in single, unbranched vessels. Jack Alexander, Dr. Lipowsky and Frank Feliciotto (graduate student, Bioengineering) are developing the instrumentation needed for the measurement of hemoglobin concentration and oxygen saturation in single vessels *in vivo*. Dr. Schmid-Schönbein has analyzed the distribution and interactions of leukocytes and erythrocytes in the microcirculation by cinemicrophotography *in vivo* and by the use of laboratory model simulation.

The research program on Macromolecular Transport across Arterial Wall is being carried out in collaboration with investigators at several other institutions. Drs. Chien, Fan and Usami, in collaboration with Dr. Colin G. Caro (Imperial College of London) have investigated the effects of oscillatory length variations and static pressure changes on the uptake of radioiodinated albumin by the common carotid artery. Ultrastructural studies have been carried out in parallel with these uptake measurements. Dr. Lee has investigated the morphological features of the common carotid artery under these experimental conditions by scanning and transmission electron microscopy. Drs. Chien and Schmid-Schönbein have studied the distribution of plasmalemmal vesicles in the arterial endothelium by

morphometric technique. Drs. Jan and Handley have investigated the dynamics of vesicle transport by the use of electron dense markers and the morphology of intercellular junctions and attached vesicles by the freeze fracture technique. These ultrastructural studies are performed in collaboration with Drs. George E. Palade, Nicolae Simionescu and Maia Simionescu (Yale University). Closely related to the experimental program are the theoretical investigations on arterial transport. Dr. Skalak has modeled the shape of vesicles attached to the plasmalemmal membrane. Dr. Sheldon Weinbaum (City University of New York) has performed theoretical studies on the dynamics of Brownian collisions in relation to vesicle detachment and the force balance in vesicle diffusion. Dr. Robert Pfeffer (City University of New York) has developed a model for mapping the concentration profile of macromolecules in the arterial wall following localized endothelial injuries.

The interdisciplinary training program on Rheology in Cardiovascular Diseases currently has three predoctoral and six postdoctoral fellows. Shlomoh Simchon (graduate student) is continuing his studies on the effects of variations in renal blood flow and red cell concentration on the secretion of renin by the kidney. Anne L. Thurn (graduate student) studies the effect of local endothelial injuries on macromolecular transport and ultrastructural features of the thoracic aorta. Dr. Schuessler is modelling viscoelastic properties of erythrocytes subject to shear deformation in association with Dr. Skalak. Dr. R. Lee Letcher is continuing his investigations on blood viscosity, blood volume and hemodynamic functions in hypertensive patients in association with Dr. John H. Laragh (Cornell). Dr. A. Anne Kaperonis is studying the relationship among the intracellular concentrations of hemoglobin, hydrogen ion and 2, 3-diphosphoglycerate in various fractions of sickle cells in association with Dr. John F. Bertles (Medicine, St. Luke's Hospital). Dr. Handley is studying the Ultrastructure of carotid arterial endothelium and erythrocyte membrane by freeze fracture in association with Dr. Jan. Dr. David Sackin is investigating the changes in blood viscosity, blood volume and hemodynamic functions in patients with acute myocardial infarction in association with Drs. Jan and J. Thomas Bigger, Jr. (Medicine). Dr. Syngcuk Kim (graduate student) is studying the microcirculation in the dental pulp by the use of ^{133}Xe washout, microspheres and intravital microscopy in association with Drs. Chien, Usami and Lipowsky. Dr. Kim and Howard Wasserman (dental student) have determined the partition coefficient of ^{133}Xe between blood and various oral tissues, including the dental pulp.

Dr. David Schachter and his colleagues are studying the molecular organization and function of biological membranes. The mechanism by which vitamin D regulates the intestinal absorption of calcium is under investigation by Szloma Kowarski, who has identified membrane components of the intestinal calcium pump; purification of these components and reconstitution of the transport activity will provide insights into the active cation transport and the mechanism of action of vitamin D. Dr. Richard E. Abbott is synthesizing impermeant probes for covalent labeling of membrane proteins. With Richard M. Seegers and Patricia H. Kiyasu, the probes are being applied to isolate and quantify sulfhydryl-containing proteins of the human erythrocyte membrane and to relate these proteins to membrane function. Dr. Abbot, Dr. Ellen R. Batt and Miriam Livneh are identifying and isolating the proteins responsible for transport of D-glucose across the human erythrocyte membrane. Procedures have been developed to label such components on the outer and inner surface of the cell and an asymmetric biochemical organization has been demonstrated. Michael Flamm (medical student) is utilizing the covalent probes to examine the effects of membrane lipid fluidity on the major intrinsic protein of the human erythrocyte membrane. Dr. Thomas A. Brasitus and Theofanis Mamounas are investigating functional interrelationships between lipids and proteins in the plasma membranes of small intestinal epithelial cells. Such protein-mediated functions as cation ATPases, glucose transport and adenylyl cyclase are strongly influenced by lipid fluidity, indicating that they are intrinsic to the lipid region of the membrane; other enzymes, including disaccharidases and leucine aminopeptidase, are relatively uninfluenced by lipid fluidity and hence extrinsic to the membrane lipid. The lipid fluidity of liver cell plasma membranes is under investigation by Carol J. Livingstone (graduate student). A characteristic thermotropic transition has been identified and its relationship to membrane enzyme activities is under study. Dr. Uri Cogan of the Technion-Israel Institute of Technology, Haifa, Israel, has joined the group as a visiting professor this year and has initiated studies to characterize vitamin A-binding activities in plasma membranes of small intestinal epithelial cells.

The Division of Neurobiology and Behavior continued to study the function and biochemical organization of the nervous system in an attempt to provide cellular explanations for behavior. In the laboratory of Mammalian Neurophysiology, Dr. Jack Martin continued his work of correlating human psychophysical experimentation with basic neurophysiology of the somatosensory system in several areas of investi-

gation. The Laboratory of Neurobiology, under the direction of Dr. Eric Kandel, has been studying the cellular mechanisms of simple forms of learning in *Aplysia*. Terrell Walters (graduate student), Drs. Thomas Carew and Eric Kandel studied the neural control of locomotion and have found that an identical "conflict" stimulus can produce opposite effects on escape walking, depending upon the animal's past experience. Dr. Kandel and his colleagues have found that a common mechanism, modulation of a voltage dependent calcium-channel, accounts for a variety of behavioral modifications. Marc Klein (graduate student) has found that the presynaptic facilitation underlying behavioral sensitization involves an increase in calcium current, and that the synaptic depression that is responsible for habituation is due to a decrease in calcium current. Drs. Eli Shapiro and Vincent F. Castellucci found that presynaptic inhibition represents the mirror image of presynaptic facilitation and involves a decrease in calcium current, whereas the voltage-dependent release of transmitter is due to the voltage-dependence of the calcium channel. Drs. Carew, Castellucci and Kandel have examined the relation of short- to long-term memory and found that the prolonged inactivation of the sensory neuron to motor neuron synapse that accompanies long-term habituation can be reversed by a single sensitizing stimulus to the head. In the laboratory of Neuromorphology, Drs. Craig Bailey and Elizabeth Thompson have continued to apply the special double-label marking techniques they developed to identify for ultrastructural study both the pre- and postsynaptic elements of identified synapses in *Aplysia*, in order to gain insights into the mechanisms underlying simple forms of learning. In collaboration with Robert Hawkins, they have found that the synapses of the presynaptic facilitating neurons which mediate sensitization contain vesicles similar to those of known serotonergic neurons and that the facilitatory cells also handle exogenously injected serotonin in similar fashion, further supporting the hypothesis that serotonin is an important modulatory transmitter in *Aplysia*. In the laboratory of Developmental Neurobiology, Drs. Sam Schacher and Michele Jacob are studying the cell lineage of specific identified cells by marking cells from the time of their birth and tracing them until they can be clearly recognized on the basis of their mature, differentiated properties as neurons. Stephen Rayport (graduate student) has been studying the electrophysiological concomitants of the differentiation of specific identified cells and has found that, during a critical phase of development, two specific identified cells form transient electrical synaptic contacts with one another. In the laboratory of Biophysics,

Dr. John Koester has continued his investigation of cellular aspects of the generation of behavior in *Aplysia*. In collaboration with Dr. Shapiro and Dr. John Byrne of the University of Pittsburgh, he has investigated the role of various membrane ionic conductances in the neuronal integrative functions underlying inking behavior. David Mandelbaum (graduate student) has shown that the serotonergic heart-excitatory cell in *Aplysia* exerts its motor effect by increasing cardiac levels of cyclic AMP. Michael Segal (graduate student) has begun to examine the effect of changing the neuronal membrane lipid composition in the properties of different conductance channels.

The Laboratory of Neurochemistry under the direction of Dr. James H. Schwartz has been studying the life history of various membranous subcellular structures in identified *Aplysia* neurons and probing the molecular mechanism of fast axonal transport. With Ariel Sherbany (graduate student) and Dr. Richard T. Ambron (Anatomy), Dr. Schwartz has analyzed the formation of glycolipids and their association in membrane with rapidly turning over glycoproteins. With Dr. Beverly Lubit and David Harris and Leonard Cleary (graduate students), he has raised specific antibodies in rabbits against *Aplysia* actin, myosin and certain membrane components. These are being used immunohistochemically to localize the subcellular distributions of the immunogens within neurons. In order to examine the mechanism of fast axonal transport with Dr. Daniel J. Goldberg (Pharmacology), these antibodies are being injected into living neurons and tested for their pharmacological effect on fast transport. The mechanism of fast transport is also being approached with Dr. Hideki Gotoh and Lise Castellucci (graduate student) by injecting inert particles coated with various protein constituents. Dr. Ludmiela Shkolnik and Dr. Schwartz are studying the genesis of the serotonergic vesicle in the cell body of an identified neuron and its subsequent development in the axon and nerve terminals in extensive regional electron microscope studies.

The Laboratory of Neuropsychology has continued an analysis of the neural basis of motivational states in *Aplysia*. Drs. K. Weiss and Irving Kupfermann have been analyzing the function of an identified histaminergic neuron that produces highly unusual synaptic effects on its follower cells. Dr. Steven Rosen has been studying the organization of sensory inputs to regions of the nervous system that control feeding. David Mandelbaum has been studying cAMP-dependent phosphorylation and dephosphorylation of several muscle proteins. Bernard Kuslansky (graduate student) has been developing a

technique that will permit precise alteration of degree of gut distension in free moving animals, so that the role of gut mechanoreceptors in satiation of feeding can be studied.

Dr. William L. Nastuk and his associates have continued their studies of postjunctional receptor desensitization, auto-immune models of myasthenia gravis, cholinergic vesicle recycling, excitation-contraction coupling in skeletal muscle and the modes of action of selected pharmacological agents on synaptic transmission and conductile membranes. With Dr. William D. Niemi and Dr. Otto J. Plescia of Rutgers University, the levels of receptor antibody, complement activity, neuromuscular blocking action and muscular weakness produced at various stages during the response of rabbits immunized against cholinergic receptor protein are being studied. Dr. Nuran M. Kumbaraci (postdoctoral fellow) has shown that tetrahydrocannabinol, an active ingredient of marihuana, can block neuromuscular transmission by interfering with the release of acetylcholine from motor nerve terminals. Dr. Joseph F. Gennaro, Jr. and Dorothy T. Rutherford (Department of Biology, New York University) have continued their electron micrographic analyses of cholinergic vesicle recycling processes and on the ultrastructural changes which occur at the neuromuscular junction of myasthenic frogs which have been immunized against cholinergic receptor protein. Dr. Nastuk and Angeles Ribera (graduate student) are exploring further the intracellular action of calcium in receptor desensitization by using ruthenium red to inhibit calcium sequestration in muscle fiber mitochondria.

Drs. Martin Blank and Lily Soo have shown that the rate of ion transport through ultra-thin films of red cell membrane proteins suggests the existence of compartments in the membrane and a need for specialized carriers through this layer. With Robert G. King, they have shown that the rheological properties of the same protein films parallel the properties of the intact red cell membrane; these experiments show that many of the properties of the normal membrane are probably due to a thin layer of negatively charged proteins on the inner face. Dr. Blank has continued to develop the theoretical implications of the surface compartment model of the natural membrane in collaboration with E. Mahmoud and P. Landauer of Electronic Associates, Inc.

Dr. Raimond Emmers' studies on pain indicated that electrical stimulation of the periaqueductal gray substance (PAG) agitates certain nociceptive neurons of the rat thalamus. This agitation interferes with the ability of these neurons to respond to intense stimulation of the skin and nerves, suggesting the

reason why activation of the PAG suppresses pain in animals and patients. Dr. Valentin Corpus assisted in work on the effects of growth hormone on the neural control of nutritional balance. Gerardo Bilotto (graduate student) analyzed the mechanisms whereby estrogen depresses the activity of those hypothalamic neurons which are involved in the control of food intake.

Dr. Michel Ferin and associates have continued their research on neuroendocrinological aspects of reproduction in primates, using female rhesus monkeys, and exploring the brain areas and neural pathways involved with gonadotropin and prolactin secretion, the endocrine modulation of neurohormone release, and the effects on estrogens and neuroleptic drugs on the anterior pituitary.

Dr. John P. Reuben and his associates have continued their studies on contractile protein interactions in single intact and skinned muscle fibers, employing light scattering techniques and have determined the characteristics of the sarcoplasmic reticulum in normal and diseased human single fibers. Single muscle fiber techniques have been developed for studying both contractile and Ca-regulating systems in normal diseased states.

Dr. Jorge Fischbarg has continued to study the problem of fluid transport across epithelia. With Dr. Jong J. Lim and Sheila Fischer (student) a theoretical model is being developed to represent such fluid transport. With Dr. Lim he has determined the intracellular potential of a fluid-transporting epithelium of central interest to the laboratory, the corneal endothelium. Dr. Lim and Calvin Warshavsky (medical student) have measured the permeability to water of corneal endothelium. With Mr. Warshavsky, Hunson Soong (medical student) and Dr. Takeo Iwamoto, a specialized dissection technique needed for the study of corneal endothelium has been developed. With Dr. Charles J. Koester, a computerized optical procedure to determine the osmotic water permeability of cell membranes is being developed.

Dr. Qais Al-Awqati and Troy E. Dixon (postdoc-

toral fellow) are studying the energetics of H^+ transport in urinary epithelia and have shown that the H^+ pump of the turtle bladder is a reversible proton-translocating ATPase; using voltage and pH clamp experiments they have been able to have the pump run backwards and synthesize ATP. With Dr. Herbert S. Chase, Jr. (postdoctoral fellow), Dr. Al-Awqati has developed a rapid uptake method for the measurement of the permeability of the luminal membrane of the toad bladder to sodium.

Dr. Hugh N. Nellans is examining the cellular and extracellular routes of intestinal calcium transport using both voltage-clamp and extracellular probes techniques; mechanisms of calcium transport in isolated membrane vesicles are being studied using both luminal and basolateral membrane preparations.

Honors

Dr. Kandel delivered the NIH Lecture at Bethesda, the Elwyn Semrad Memorial Lecture at Harvard, and the Giarman Lecture at Yale. Dr. Al-Awqati was elected to membership in the American Society for Clinical Investigation. Dr. Blank was appointed to the editorial boards of the *Journal of the Electrochemical Society*, *Bioelectro-chemistry and Bioenergetics*, and the *Journal of Colloid and Interface Science*. Dr. Nocenti was the recipient of the Golden Tooth Award from the dental students, Class of 1981.

Donors

American Heart Association, Coffey Research Gift, Magnus & Georgianne Gregersen Fund, Heart and Lung Foundation, Irma T. Hirschl Trust, The Klingenstein Foundation, Maxwell Upson Foundation, Josiah Macy, Jr. Foundation, McKnight Foundation, Muscular Dystrophy Association, National Science Foundation, National Institutes of Health, New York Heart Association, Mrs. George W. Perkins, Scaife Family Charitable Trust, David and Irene Schwartz, Alfred P. Sloan Foundation, Smith Kline & French Foundation, and anonymous donors.

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Psychiatry

EDWARD J. SACHAR

Lawrence Kolb Professor and Chairman of the Department • Director of Service

The year 1978 was an important one for the continued reorganization of the Department of Psychiatry which began in the Fall of 1976. Following the retirement of Dr. Sidney Malitz from the positions of Vice Chairman, Department of Psychiatry and Deputy Director of the New York State Psychiatric Institute, Dr. Michael Sheehy was promoted to fill these two roles in May 1978. Dr. Sheehy was formerly Chief of Psychiatry in Vanderbilt Clinic. He has continued the role of Acting Director of Residency Training in the Department pending the results of a Search Committee for a recommendation of a permanent Director.

After an extensive search following the retirement of Dr. William Thetford, Dr. Rachel Gittelman was appointed Chief of Clinical Psychology. Formerly, Dr. Gittelman had been director of the Child Development Clinic at Hillside Hospital in Glen Oaks, New York, and Associate Professor of Psychology at Queens College, City University of New York. Dr. Gittelman brings to the Department of Psychiatry her abundant resources as a clinician and clinical researcher, particularly in the field of child psychology and psychiatry.

Dr. Francine Cournos was appointed Director of the Washington Heights Community Service at Psychiatric Institute, succeeding Dr. Manuel Trujillo. She had been Director of the Community Service Inpatient Ward.

Dr. Gene Abel and Dr. Judith Becker joined the Department and began a major research and treatment program in sexual behavior. This program has

received national recognition for its pioneering work in the study and treatment of sexual aggressives and pedophiles.

Dr. Frederic Kass was appointed Chief of Psychiatry in Vanderbilt Clinic, after leaving his position as Associate Director of Psychiatric Outpatient Services at Bronx Municipal Hospital Center. Dr. Stanley Bone became Physician-in-Charge of Psychiatric Emergency Room Services and Ms. Susan Matorin was appointed to the position of Chief Psychiatric Social Worker.

The Department of Behavioral Endocrinology, under the leadership of Dr. Edward J. Sachar, was joined by Drs. Gregory Asnis and Uriel Halbreich. Dr. Asnis had formerly been on the staff of SUNY at Stonybrook, while Dr. Halbreich joined the Department from Israel.

Dr. Frederic Quitkin was appointed to the role of Director of the Depression Evaluation Service at Psychiatric Institute. This Service was established for the evaluation of patients with Affective Disorders and has assumed an important role in both entering suitable individuals into the studies, and providing referrals to the various clinics in the Institute as well as private physicians associated with the Department.

In the Department of Child Psychiatry, under the leadership of Dr. David Shaffer, Dr. Hector Bird, formerly of St. Luke's Hospital, was appointed as Director of Clinical Outpatient Services.

Major changes took place at the Columbia affiliated hospitals during the year. At Roosevelt Hospi-

tal, Gary Lefer, M.D., was appointed to the role of Associate Director, having left his post at Kings County Medical Center. Dr. Elizabeth Davis, who had served for sixteen years as Director of the Department of Psychiatry, at Harlem Hospital, retired and was replaced by Dr. Austin Moore as Acting Director. Dr. Seymour Gers was appointed Associate Director and Chief of Intensive Care Services. At St. Luke's Hospital, Dr. Eugene Feigelson resigned as Director of Psychiatry to become Professor and Chairman of Psychiatry at Downstate Medical Center while Dr. David M. MacDonald was appointed Acting Director of Psychiatry at St. Luke's. Dr. Leo Kron was appointed Director of the Child Psychiatry Clinic at St. Luke's, replacing Dr. Bird who joined Dr. Shaffer's Department.

During the past year the General Clinical Service at Psychiatric Institute was reorganized and renamed the General Clinical Research Service. Dr. Lyle Rosnick was appointed Clinical Director of the Unit, and Dr. Gregory Asnis was named Associate Director.

Teaching Activities

During 1978, the Department increased the scope and popularity of its teaching activities substantially.

Medical Student Education, under the directorship of Dr. Jerrold Maxmen, increased its emphasis on the teaching of the psychiatric and social aspects of general medical and surgical care. The program expanded teaching in child and geriatric psychopathology as well as in human sexuality. Steps have been taken to enhance faculty teaching skills by the use of workshops in the teaching of psychiatry, by directly observing and supervising faculty teaching, and by providing more thorough and systematic student feedback to instructors.

During the pre-clinical courses, students are spending relatively more time seeing general medical patients and are also given problem-solving exercises. During the clerkship new programs are being piloted including daily morning rounds, consultation liaison teaching, expanded emergency room work and the use of self-assessment quizzes. About 15% of the senior class are seriously considering entering psychiatric residency, which compares favorably with the national average of 4-1/2%, as well as representing a major increase in the interest in psychiatry on the part of Physicians and Surgeons medical students.

The Basic Residency Training Program in Psychiatry under the leadership of Dr. Michael Sheehy, Acting Director of Residency Training, with the assistance of Dr. Stuart Yudofsky, Assistant Director of Residency Training, continued its major

commitment to an ambitious core curriculum for residents in the first two years of training followed by ample time in the PGY IV for elective programs in research and patient care. Among the best received educational exercises were the courses on Criticism of the Scientific Literature in Psychiatry taught by Dr. Donald Klein, and the Basic Clinical Interviewing Course, taught by Drs. Sheehy and Spitzer. For the first time, core educational seminars in the Basic Residency Program were made available to residents from Harlem Hospital. In addition to the department-wide Grand Rounds program at Psychiatric Institute, which received CME-I credit this year, a Clinical Grand Rounds program was instituted in Vanderbilt Clinic on a monthly basis, drawing eminent psychiatric clinicians to review and discuss resident protocols as well as to interview the patients.

The Basic Residency program in Child Psychiatry increased its teaching activities during the year. A child psychiatry training grant was received from NIMH. Additionally, four Child Psychiatry Fellowship lines were assigned to the Department by Queens Children's Psychiatric Center, and three lines were also assigned from Manhattan Children's Psychiatric Center. A range of new courses including seminars in Research Methodology and Therapeutic Skills were introduced. Direct observation methods were widely used in supervision. Faculty within Child Psychiatry began offering systematic courses to the Psychiatric Epidemiology Training program as well as increasing their contribution to undergraduate medical student education. During the summer of 1978, an Introductory Course in Child Psychiatry was provided for child residents for all of the Columbia Consortium hospitals. Research colloquia within the department during the year were chaired by Drs. Michael Rutter and Keith Connors. Child Psychiatry Grand Rounds were approved for CME-I credit.

During the month of October, the Center for Psychoanalytic Training and Research sponsored a one-day symposium on "The Fate of Individualism in Our Time: Narcissism and the Limits of Autonomy." More than 300 participants attended this highly successful event which involved the participation of a distinguished group of visitors including Professors Hans Morgenthau, Christopher Lasch and Steven Marcus as well as Drs. Otto Kernberg and Ethel Person from the Center's own staff.

The Center revised its adult curriculum in psychoanalytic training to include two elective tracks concentrating on clinical questions in the understanding and treatment of either adults or children. The program of studies in psychoanalysis for Columbia

undergraduates was strengthened while postgraduate groups were continued for psychoanalysts at the same time as extension courses were offered to social workers and other mental health personnel.

The Neurobehavioral Sciences Research Training Program, directed by Drs. Murray Glusman and Eric Kandel, completed a highly successful first year with a full complement of pre and postdoctoral trainees. An important feature of the program was an excellent series of seminars and colloquia which brought to the Medical Center leading neuroscientists from academic institutions throughout this country as well as from abroad.

Drs. Richard Bodnar and Dennis Kelly participated in the Neurobiology course given to the second year medical students while Drs. Glusman, Kelly, Bodnar and Potegal gave a course of lectures on selected topics in the Neurobehavioral Sciences to residents from psychiatric centers throughout the State of New York.

The Department of Neuropathology and Neurotoxicology, under the leadership of Dr. Leon Roizin, taught a course in the Neuropathology of the Disease Processes of the Central Nervous System including both theoretical and practical demonstrations to the Postgraduate Training Program in Psychiatry and Neurology at Psychiatric Institute.

For the first time, under the leadership of Dr. Marshall Primack, the Department of Clinical Medical Services undertook extensive teaching of psychiatric staff regarding the medical illnesses of patients at the psychiatric Institute. This teaching was universally well received.

The semi-private inpatient psychiatric service on the 12th floor of the Neurological Institute, directed by Dr. Stuart Yudofsky, expanded its activities in teaching. The Service continued to sponsor a highly rated and selective senior medical student elective with fifteen students from the class of 1979 taking advanced clinical electives in psychiatry. Additionally, two senior residents from the basic residency training program functioned for six months each as clinical administrators of the unit with major responsibilities in patient care, milieu coordination and medical student teaching.

Among the affiliate programs, St. Luke's Department of Psychiatry staff, who are members of the Mental Health Division of the Columbia University Health Service, established a new clinical elective for psychiatric residents and psychology interns from St. Luke's and other hospitals. The elective includes short-term treatment and evaluation of college age students, psychoanalytically-oriented supervision, and discussion groups on such topics as time-limited

psychotherapy, young adult development and specific issues of sex roles and identifications.

At Roosevelt Hospital, the Grand Rounds program was again accredited by the APA for fifty hours of category 1 CME credit. The Basic Residency Training Program under the leadership of Dr. William Tucker was awarded a new NIMH basic training grant, scheduled to run for three years. Five senior residents completed their training in June. Since July of 1978 eighteen residents have been involved in training in all four years of the program as well as six psychology interns and ten externs.

In December of 1978, graduate nursing students, who were enrolled in the Master of Science for Nursing at State University of New York at Stonybrook, rotated through the Consultation-Liaison Service of the Adult Psychiatric Outpatient Clinic, as a field placement, in the Department of Psychiatry at Harlem Hospital.

Research Activities

During the past year, the Division of Behavioral Endocrinology, under the leadership of Dr. Edward J. Sachar, received an NIMH program project award for a 2½ year period beginning in January of 1978. The grant supports a group of ongoing studies of neuroendocrine abnormalities and depressive disorders in schizophrenia, of hormonal responses to psychotropic drugs in psychiatric patients and normal subjects, and of the neuropharmacologic regulation of a variety of hormonal responses.

Within the Department of Child Psychiatry, abundant new research occurred. Work continued, under the direction of Dr. Puig-Antich, investigating the psychobiology and treatment of prepubertal depression. Preliminary findings from this study have shown that sleep and neuroendocrine changes in prepubertal depressives are similar to those in depressed adults. The Department is participating with the NIMH Clinical Research Center carrying out an epidemiological study into the relationship between neurological soft signs and psychiatric morbidity in adolescence (Dr. Shaffer), and into the psychoendocrine correlates of precocious puberty (Drs. Ehrhardt and Meyer-Bahlburg). Dr. Denise Kandel received funding from NIMH to investigate drug use and social roles in women, while grants were received from the Ford Foundation for investigation into the sequelae of prenatal drug exposure, from Endo Pharmaceuticals for a pilot study into the effects of molindone hydrochloride on aggressive children (Dr. Greenhill), from the Skerryvore Foundation and from Mrs. Hazen Annenberg for continued research by the Robinson Reading Clinic.

Considerable work occurred in the development of new research instruments. Drs. Puig-Antich and Chambers have developed a reliable adaptation of the SADS for children.

In the Department of Genetics, Drs. Erlenmeyer-Kimling and Rainer have studied early signs of vulnerability to schizophrenia in high-risk children including assessment of attentional processes and other subjects of information handling. Drs. Baron and Rainer are collecting family and pedigree data for incorporation into a multiple threshold transmission model for both schizophrenia and manic depressive illness.

In the Division of Neurosciences, under the leadership of Dr. Maurice Rapport, evidence for an experimental model of epilepsy has been expanded. Work analyzing the antigenic components of synaptic membranes is underway, as well as studies of the immunohistological detection of brain tumors. Dr. Hadassah Tamir has continued her studies of the serotonin-binding protein.

In the Department of Psychophysiology, Drs. Spring, Sutton, Hakerem, Kietzman and Bruder have collaborated in a cross-laboratory study of vulnerability to schizophrenia in adults. Dr. Bruder has pursued studies of hemispheric dysfunction in patients with major affective disorder while theoretical work on temporal expectancy in learning has been further developed by Dr. John Gibbon, producing a quantitative theory of the way in which temporal associations are formed. This theory has recently received some application in studies of early mother-infant interactions.

In the Social Psychiatry Research Unit, Drs. Bruce and Barbara Dohrenwend, in collaboration with Fellows in the Research Training Program in Psychiatric Epidemiology, completed a report on the epidemiology of psychiatric disorders for the President's Commission on Mental Health.

The Division of Neurobiology and Behavior continued to study the function and biochemical organization of the nervous system in an attempt to provide cellular explanations for behavior. In the laboratory of Mammalian Neurophysiology, Dr. Jack Martin continued his work correlating human psychophysical experimentation with basic neurophysiology of the somatosensory system in several areas of investigation. In the laboratory of Neurobiology, Dr. Eric Kandel and colleagues continued the study of cellular mechanisms of simple forms of learning in *Aplysia*. This laboratory has discovered that a common mechanism—modulation of a voltage-dependent, calcium channel—accounts for a variety of behavioral modifications.

In the laboratory of Neuromorphology, Drs. Craig Bailey and Elizabeth Thompson have continued the use of their special techniques to investigate the ultrastructure of both pre and post-synaptic elements of identified synapses in *Aplysia*. The purpose of this work is to gain further knowledge into the mechanisms underlying simple forms of learning.

In the laboratory of Developmental Neurobiology, under the leadership of Drs. Sam Schacher and Michele Jacob, the cell lineage of specific identified cells has been traced by marking them from the time of birth until they can be clearly recognized on the basis of their mature, differentiated properties as neurons. In association with this work, Dr. Stephen Rayport has investigated the electrophysiological concomitants of the differentiation of specific identified cells and has found that during a critical phase of development two specific identified cells formed transient electrical synaptic contacts with one another.

In the laboratory of Biophysics, Dr. Koester in collaboration with Dr. Shapiro and Dr. Byrne of the University of Pittsburgh, has investigated the role of various membrane ionic conductances in neuronal integrative functions underlying inking behavior in *Aplysia*.

In the laboratory of Neurochemistry, under the direction of Dr. James Schwartz, studies of the life history of various membranous subcellular structures in identified *Aplysia* neurons was undertaken. Investigation into the molecular mechanism of fast axonal transport was undertaken as well.

In the laboratory of Neuropsychology, Drs. Weiss and Kupferman continued their analysis of the neural basis of motivational states in *Aplysia*.

In the Department of Geriatrics Research, under the leadership of Dr. Barry Gurland, a two-year study of alternative treatment modalities for the elderly in New York and London has been the current thrust of research, including assessments of the psychiatric medical and social condition of community-based and institutionalized elderly in both cities. Among the important findings of this work were the discovery that rates of senile dementia, among elderly residing in the community, were higher in New York than in London. This difference could not be readily explained by the demographic characteristics of the two populations. On the other hand, rates of depression were found to differ cross-nationally. Although the rates for men rose steeply after age 70, in women they remained level or declined slightly with age.

In the Department of Lithium Studies in Manic Depressive Disorders, the major thrust of research over the past year has continued in the areas of genet-

ics of depressive and manic-depressive disorders and the mechanism of action of the lithium ion. These goals were better defined by a change in the department name from "Internal Medicine" to "Department of Lithium Studies in Manic-Depressive Disorders," with its outpatient facility retaining the name "The Lithium Clinic." The Department continues under the leadership of Dr. Fieve.

To date, genetic marker typings at 30 loci have been completed on 1300 individuals from 182 families of bipolar and unipolar probands. The pooled multi-center genetics data is currently being analyzed statistically at the genetics laboratory of Drs. Robert Elston and Rodney Go at the University of North Carolina with the hope of delineating a mode (modes) of genetic transmission for these disorders and formally establishing genetic linkage between affective illness and known genetic biochemical markers.

Multiple new projects have begun including an extensive cross sectional and prospective investigation of kidney function before and after long-term lithium administration.

In the Department of Therapeutics under the leadership of Dr. Donald Klein, several studies of known effective psychopharmacological agents attempted to determine their optimal use for a specific patient group in terms of dose level and duration. Determination of the risk-benefit ratio as regards side effects was also undertaken. In a study of drug maintenance dose, the Department of Therapeutics compared the effects of standard versus reduced dosage levels of antipsychotic agents for chronic schizophrenic patients. The objective of this study is to determine whether lower dosage levels will decrease the risk of neurological side effects including tardive dyskinesia while adequately controlling symptomatology and maintaining social function.

Several studies of antidepressants have been undertaken including research into the effectiveness of an experimental drug, Mianserin, which is remarkably free of side-effects. Another project involves the investigation of depressed patients who are refractory to standard treatments. These patients are given both unusual antidepressants and combinations of standard antidepressants. Blood levels are monitored to determine appropriate dosage levels.

A concurrent study concerns the treatment of alcoholics who experience panic attacks and who presumably drink to alleviate either their anticipatory anxiety or panic episodes. Since antidepressant medication is effective in treating panic attacks, it seems possible that this subset of alcoholics may be able to reduce their alcohol consumption if effective treatment for their panic attacks can be prescribed. A

more basic project addresses the question of pathophysiological vulnerability in anxiety disorders. The utility of imipramine as a blockade to both naturally occurring and experimentally induced panic attacks in patients with Panic Disorder is being concurrently investigated.

In the Division of Behavioral Physiology, Drs. Bodnar, Kelly and Glusman have continued their studies on intrinsic pain regulatory mechanisms in mammals and their relationship to the endorphins and enkephalins. Dr. Donald Hutchings has continued his work on behavioral teratology and found clear-cut evidence of behavioral disturbances in rats born to mothers exposed to methadone during pregnancy.

Dr. Bodnar has received a three-year grant from NIMH to study stress-produced analgesia and neurobehavioral analysis. Significant awards were also received by Dr. Hutchings, to study the behavioral effects of methadone during pregnancy, and by Dr. Kelly, to study modification of the pain response of primates via non-narcotic psychotropic agents. Dr. Potegal also received a substantial award for his research into the inhibition of intraspecific aggression by septal stimulation in the golden hamster.

The General Clinical Research Service, under the leadership of Dr. Lyle Rosnick continued its studies into hormonal and biochemical measurements to enhance the diagnosis and psychopharmacologic treatment of depressive and schizophrenic disorders. Six studies were undertaken, two of which occurred in the area of behavioral endocrinology and four involved comparisons of various psychopharmacologic treatments for depressive disorders.

The Department of Biometrics Research, under the direction of Dr. Robert L. Spitzer continues to work in two major areas of diagnosis and the effects of deinstitutionalization of psychiatric patients. Dr. Spitzer, as Chairman of the American Psychiatric Association's Task Force on Nomenclature and Statistics, has continued to guide the development of the third edition of the Diagnostic and Statistics Manual of Mental Disorders (DSM-III). Field trials of the most recent draft of DSM-III have involved several hundred clinicians evaluating over eight thousand patients. The reliability of the major classes of diagnostic categories is far higher using the DSM-III diagnostic criteria than has previously been reported for non-research settings using earlier diagnostic manuals.

Also in the Biometrics Research Unit, Dr. Jean Endicott, a principal investigator of the NIMH Collaborative Study of the Psychobiology of Depression continued her coordination of all data collection from the five clinical centers participating in this project. Pilot data indicated the reliability of diagnostic judg-

ments across centers using the Research Diagnostic Criteria (RDC) and the family history (RDC). One major finding of this study to date is that, contrary to common clinical belief, the presence of endogenous-like clinical features in patients with a Major Depressive Disorder is relatively independent of the presence or absence of stressful life events.

The Deinstitutionalization Study Project in the Biometrics Research Unit, directed by Carol Schwartz, neared completion of its Needs Assessment and Cost Benefit Outcome Study of 120 Chronic Schizophrenic Patients in Northern Manhattan. Findings from this study have major implications for the New York State Office of Mental Health's new Community Support Program in the evaluation and role of the mental hospital in the long-term care of the chronic patient, the role of the outpatient aftercare clinic system, the role of the family and social support system in the rehabilitation of the patient in the community and the cost and cost-effectiveness of the community policy versus total institutional care. Study findings will be used shortly in the development of new programs for chronic patients to be tested experimentally in the new Washington Heights Community Service delivery system.

The Department of Communication Sciences, under the leadership of Dr. Joseph Jaffe demonstrated that computer analysis of vocal activity in endogenous depressed patients could be used as a predictor of subsequent imipramine plasma levels. Voice spectral analysis was also used as a discriminator in the study of anxiety attacks induced by lactate infusions and in the comparison of performance between dyslexic children and matched controls.

In the Department of Biological Psychiatry, Dr. Jerome Jaffe produced a pilot study of behavioral modification techniques used to switch cigarette smokers from high to low nicotine cigarettes.

During the year several studies were conducted by the staff of the Depression Evaluation Service. In particular, clinical discriminators were sought to predict response or non-response to tricyclic antidepressant drugs on the part of depressed patients.

On the semiprivate service of Neuro 12, Dr. Yudofsky received a grant to study the clinical and neuropharmacologic effects of ECT on patients with Parkinson's Disease. In the Vanderbilt Clinic, Drs. Druss, Bone and Kass began a study on patients appearing at the psychiatric emergency room who were in concurrent private psychotherapy.

Under the leadership of Dr. Leon Roizin, the Division of Neuropathology and Neurotoxicology continued its investigations into the relationship between psychotropic drugs, ultrastructural morphology,

brain protein metabolism within the cell and intra and interneuronal communication mechanisms.

The Department of Epidemiology undertook a number of research evaluations during the year. Dr. Patricia Cohen has been deriving measures of the functional status of chronic mental patients from observations of 20,000 individuals made at two points in time. Drs. Muhlin and Rabkin are near completion of an interview schedule designed to assess neighborhood characteristics pertinent to the environment of the discharged mental patient. Finally, Dr. Struening and colleagues are in the final stages of developing a descriptive typology of geographical areas for New York City.

In sum, the year 1978 was a period of extraordinary diversity and productivity for psychiatric research within the department.

Patient Care Activities

In the Department of Child Psychiatry, the service program has been substantially enlarged during the past year. The number of visits to the Child Psychiatry Outpatient Department during the last quarter of 1978 ran at 150% above the level for the same period during 1977. New specialized clinical services for children with psychoendocrine problems and for children with neurological handicaps have been established [the latter with help from the Woodcraft Foundation]. A new outpatient waiting area has been designed and created on the 9th floor of Psychiatric Institute while an additional three rooms have been assigned to Child Psychiatry Clinical Department at Presbyterian Hospital.

In adult psychiatry at Psychiatric Institute the General Clinical Research Service admitted 80 patients during the year with an average stay between three and four months. All patients received individually-tailored combinations of treatment modalities such as individual, family and group psychotherapy, behavioral therapy, pharmacotherapy, electroconvulsive therapy, recreation and occupation therapy. Each patient's care was provided for by an inter-disciplinary team of psychiatrists, social workers, nurses and activities therapists.

Patient care activities on the Washington Heights Community Services continued at an impressive rate with over 300 patients admitted for intensive short-term care before being returned to the community and the aftercare program at 21 Audubon Avenue. This latter program maintains a comprehensive treatment program for discharged mentally ill patients from the upper Washington Heights cachement area. Toward the end of 1978 plans were undertaken in cooperation with the Regional Office of Mental Health of the New York State Department of Mental Hygiene to

centralize all state care for patients living in Manhattan above 125th Street at Psychiatric Institute and affiliated clinical operations. This project would include three wards at Manhattan Psychiatric Center as well as the Inwood Mental Health Center in addition to the present community service facilities at Psychiatric Institute itself and 21 Audubon Avenue. In psychiatric services at the Vanderbilt Clinic, some 5,000 patients were seen in the walk-in clinic in Emergency Service while approximately 10,000 visits were logged at the clinic on the 5th and 10th floors of Vanderbilt Clinic. Ms. Matorin, the Chief Social Worker, organized an expanded group therapy program while Mrs. Baldus, the Chief Psychiatric Nurse organized a crisis intervention program on the 5th floor. A new evaluation clinic was started, meeting once per week, which made available a full team of mental health professionals for the intake of patients. This was conceptualized in such a way as to amplify rather than substitute for the 24-hour-a-day service in the Psychiatric Emergency Room. Psychiatric social workers were given enlarged roles in the areas of couple, family and group psychotherapy. In addition, they provided over-census coverage for residents in evaluation clinic on a weekly basis.

At 21 Audubon Avenue in addition to those patient care functions already described, the Washington Heights Community Service began hiring of staff for an acute day hospital and a liaison team with funds provided by the Community Support Services legislation in the State of New York. These new programs will add innovative services to what is already provided and will make new alternatives to inpatient hospitalization available to community residents.

The Department of Clinical Medical Services replaced the Department of Internal Medicine at Psychiatric Institute during the year and Dr. Marshall Primack was appointed Chief of this new division. Dr. Primack has led a truly outstanding program of top quality medical care for patients at Psychiatric Institute during the past year. Sophisticated consultations with appropriate teaching of house staff has been provided on every patient admitted to the Institute during the past year since Dr. Primack's appointment.

In the Department of Genetics, genetic counseling has been provided to approximately 50 families a year with questions regarding marriage and parenthood in the face of possible genetic risk. Additionally, the Department of Neuropathology and Neurotoxicology under the direction of Dr. Roizin has served as a central reference laboratory in neuropathology and neurotoxicology for the psychiatric and developmental centers operated by the State of New York.

In this capacity the Department has carried out over 27,000 neuropathologic and over 114,000 neurotoxicologic examinations during the past year.

On the semi-private psychiatric service in the Neurological Institute Dr. Yudofsky's leadership has been amplified by the role of Dr. Sidney Malitz as Senior Consultant and Drs. David Forrest, Linda Pessar and Joel Hoffman, who have provided clinical backup for patient care as well as supervising the thirteen residents providing patient care on this service. Despite the small [15 beds] size of this service, nearly 4,700 patient days were accounted for by the hard work and dedication of the staff.

Honors

Dr. Arthur Carr was appointed Professor Emeritus of Medical Psychology by Columbia. Dr. W. Crawford Clark was elected Eastern Regional Representative of the American Pain Society. Dr. Patricia Cohen received the Raymond B. Cattell Award for outstanding work in applying multivariate statistical procedures to substantive areas. Dr. Elizabeth Davis was appointed Professor Emeritus at Columbia upon her retirement.

Dr. John Gibbon was appointed Fellow of the American Psychological Association and member of the Editorial Board of the *Journal of Experimental Psychology*. Dr. Uriel Halbreich was the 1978 recipient of the Yair Gon Award by the Hebrew University—Hadassah Medical School for the best research in psychiatry performed at that center. Dr. Donald Hutchings was elected to the Editorial Board of *Neurobehavioral Toxicology*. Dr. Denise Kandel was appointed member of the Committee on Substance Abuse, National Research Council, N.A. of Sciences and elected Associate Editor, *Journal of Health and Social Behavior*. Dr. Eric Kandel delivered the NIH lecture, the Elwyn Semrad Memorial Lecture at Harvard Medical School, and the Giarman Lecture at Yale Medical School. He was also elected as fellow of the American Association for the Advancement of Science. Dr. Dennis Kelly was elected a Fellow of the New York Academy of Sciences.

Dr. Eric Marcus was named the Distinguished Teacher of the Year in the College of Physicians and Surgeons by the graduating class of medical students. Dr. Joaquim Puig-Antich was appointed member of the Subcommittee on Child and Adolescent Psychiatry of DSM-III. Dr. Leo Roizin has been appointed Secretary of the Research Group on Neurotoxicology, World Federation of Neurology; Chairman of the Program Committee for the 2nd International Symposium on Neurotoxicology; Editor of the *Journal of Neuropathology and Exper-*

imental Neurology, and Editor of *Acta Neurologica* (Italy).

Dr. Steven Roose received the New York District Branch of the American Psychiatric Association Best Research Award for Resident, 2nd Place, and the Psychiatric Institute Alumni Association's Award for best research paper by a resident. Dr. Suzanne Salzinger was elected to the Editorial Board of *Child Behavior Therapy*. Dr. David Schiebel received the Sandoz Award for superior academic achievement and contribution to health care. Dr. David Shaffer was elected to the Editorial Board of the *Journal of American Academy Child Psychiatry*; Editorial Board of the *Journal of Child Psychology and Psychiatry* and member Subcommittee on Child and Adolescent Psychiatry of DSM-III.

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Public Health

BERNARD CHALLENGOR

Associate Professor and Acting Chairman of the Department

Dr. John H. Bryant resigned as Director of the School effective April 1, 1978 and took a leave of absence effective August 1 to assume the position of Deputy Assistant Secretary of the Department of Health, Education and Welfare and Director of the Office of International Health. Dr. Bernard Challenor was appointed Acting Director and a search committee for a new Director was appointed under the chairmanship of Dr. Myron Winick, Director of the Institute of Human Nutrition.

The entire faculty of the School participated in an intensive self-evaluation process in connection with the re-accreditation of the School by the Council on Education for Public Health and of the Division of Health Administration's MPH and MPH/MBA programs in Health Administration by the Accrediting Commission on Education for Health Services Administration. Faculty retreats were held in March and September as part of this process, which culminated with a three-day joint site visit in November by both accrediting bodies.

Dr. Barbara Dohrenwend joined the School's faculty in September and will serve as Head of the Division of Sociomedical Sciences beginning January, 1979. Dr. Holger Hansen was appointed Acting Head of the Division of Epidemiology in July, replacing Dr. Mervyn Susser who was appointed Sergievsky Professor and Director of the Gertrude H. Sergievsky Center in the Faculty of Medicine.

Teaching

Demand for admission to the School's programs

continued to increase steadily as the number of applications received rose from 799 in 1977 to 867 in 1978, and School enrollment also increased. A total of 250 *new* students registered at the School for the 1978 Fall term, of which 199 were in masters degree programs, 22 in doctoral programs and 29 were non-matriculated special students. Counting continuing students, enrollment was 398 registrants for the Fall term. This figure does not include another 85 students enrolled in joint degree programs who were registered during the Fall term in other units of the University.

Three new training grants were awarded to the School by the Bureau of Health Manpower: Field Training in Environmental Sciences (Dr. Granville Sewell); Expanded Curriculum of Epidemiology Training Program (Dr. Holger Hansen); Curriculum Improvements in Health Administration/Planning (Dr. Samuel Wolfe). The Health Administration/Planning grant has a special focus on issues of cost containment in the health sector and more rational allocation of health resources. The grant will facilitate development of learning modules, case materials, better linkages between didactic and field experiences, and closer liaison with Presbyterian Hospital and the Graduate Schools of Business, Architecture and Planning.

The Division of Epidemiology's program for epidemiology majors was modified, built around a three term sequence of Principles of Epidemiology (revised), Methods in Epidemiology (newly introduced), and Strategies of Epidemiology.

Two new courses dealing with adolescent fertility and population education and socialization were offered by the Division of Population and Family Health, reflecting the expertise of its new adolescent social research unit.

Dr. Stanley Budner organized a task force on ethical and value issues in neonatology; Dr. Mitchell Schorow organized faculty seminars on teaching and learning; Dr. Stanley Fisher offered a continuing education course on medical hypnosis.

The Division of Tropical Medicine offered for the first time a continuing medical education course entitled "A Review of Parasitic Diseases for Clinicians." Because the course was so well received, it will be offered on a regular basis.

In 1978 as part of an overall curriculum revision, the School of Public Health was deeply involved in planning and implementing an integrated series of courses which introduce first and second year medical students to the practice of medicine. Within this new context, the first year courses in biostatistics and epidemiology have been expanded to nine and fifteen hours, respectively; a lecture course on the organization and financing of medical care has been added; and the Physician-Patient Relationship course, taught jointly by the School and nine clinical departments, has been extended throughout the first year to provide students with a small group setting in which to integrate and react to material from these and other courses. Dr. Stephen Rosenberg is also course director for the new second year elective in Medical Spanish.

Research

Drs. Joseph Fleiss and Brant Fries investigated the statistical properties of a number of competing procedures for making inferences about relative risk, perhaps the most important measure of association in epidemiology. Dr. Fleiss has also conducted research into the sampling distribution of estimated attributable risk (another important measure). With Drs. Neal Chilton and Sylvan Wallenstein, he has studied the applicability of ridit analysis to ordinal data collected in clinical trials.

Dr. Robert Golden successfully applied latent class analysis to the problem of estimating the prevalence of senile dementia and depression in random samples of non-institutionalized elderly individuals residing in New York and London.

Dr. Patrick Shrout is studying the applicability of structural equation techniques to the analysis of data collected at several points in time, and the use of confirmatory factor analysis in survey research. With Dr. Fleiss, he has investigated several possible de-

signs for inter-rater reliability studies and their associated intraclass correlation coefficients. With Dr. Bruce Levin, he has been studying the applicability of logistic regression models to a variety of biomedical problems.

Drs. Wallenstein and Agnes Berger have derived methods for analyzing categorical data measured repeatedly over time. Dr. Wallenstein has extended the classic Kolmogorov-Smirnov test to the comparison of several independent cumulative distribution functions, and has adapted his earlier results for the detection of clusters to the search for time clusters of certain abnormalities. With Dr. Fleiss, he has derived results useful in the analysis of quantitative data measured repeatedly over time.

Ms. Molly Park has concluded collaborative research with members of the Department of Medicine into normal growth and pathologic hypertrophy in the mammalian heart.

With Dr. Mary Curnen of the Division of Epidemiology, Ms. Livia Turgeon has applied methods of cohort analysis to the study of cancer mortality in a number of professional groups.

Dr. I. Bernard Weinstein and his associates in the Division of Environmental Sciences have continued their studies on the molecular and cellular events in chemical carcinogenesis. Together with Dr. Alan Jeffrey and Dr. Koji Nakanishi of the Chemistry Department, they have obtained further information on the chemical structures of DNA and RNA adducts formed in human, bovine and rodent tissues exposed to the ubiquitous environmental carcinogen benzo(a)pyrene. Studies done in collaboration with Dr. Dezider Grunberger of the Institute of Cancer Research and Department of Biochemistry have elucidated conformational and functional alterations in nucleic acids modified by the carcinogens N-2-acetylaminofluorene (AAF) or benzo(a)pyrene. Cell culture studies have revealed new biological effects of the phorbol esters, an extremely potent class of tumor promoting agents. These include: (1) mimicry of transformation in normal cells, (2) enhanced expression of markers of transformation in tumor cells, and (3) enhancement of carcinogen or virus initiated cell transformation. These results provide new insights into the multiple factors and multiple steps involved in the action of environmental carcinogens.

Dr. Granville Sewell received a grant from the National Science Foundation to examine the quality of scientific considerations in decisions affecting the environment.

Dr. Mary Curnen completed the collection of data regarding cancer risk among physicians and lawyers.

Dr. Bruce Dohrenwend began a study of the relationship between social stress and psychiatric disorders which is being conducted in Israel. Dr. Elmer Struening initiated a study of the length of hospital and community stay of patients admitted to New York State mental hospitals. Dr. Stephen Shafer completed a study on the reliability of areal projections of bone cancer death rates.

Dr. Inge Goldstein began data collection in an attempt to determine the relationship between atmospheric conditions and asthma epidemics in New York City and New Orleans.

Dr. Nigel Paneth investigated an outbreak of critical congenital heart disease in Monmouth and Ocean Counties in New Jersey. He also began a study to measure the impact of newborn intensive care on neonatal mortality.

Dr. Holger Hansen evaluated the effectiveness of PKU screening in New York City and completed studies on the relationship between school achievement and pregnancy risk and the decline of Down's syndrome after abortion reform.

Dr. Samuel Wolfe headed a team of faculty from the Division of Health Administration in the preparation of technical working papers on cost containment and regionalization of care for use by the board, staff and borough councils of the Health Systems Agency of New York City, Inc. These papers presented health care reimbursement alternatives, analyzed the financing and organization of ambulatory care in New York City and examined hospital bed needs.

Dr. Noreen Clark began a study to determine what educational methods would enable nurses to better utilize professional knowledge. Dr. Clark is also participating in a study with Dr. Charles Feldman (Pediatrics) to develop a self-management system for children with asthma. She continues as principal technical consultant for a study of non-formal education approaches in Kenya and the Philippines.

Mr. Robert Rosenblum and Dr. Bruce Vladeck initiated an analysis of out-of-pocket cash outlays by the elderly for health care.

The Adolescent Social Research Unit of the Division of Population and Family Health is currently engaged in research on the impact of population education on secondary school students in the U.S. Differences in knowledge and attitudes between students who have and have not been exposed to population education curricula are being assessed. Another research project underway seeks to discover what demographic variables, educational background factors, opportunities, psychological variables and significant interpersonal influences are related to quality

of parenting and educational continuation among adolescents.

Other activities of the Adolescent Social Research Unit include the presentation of descriptive studies of the Young Adult Clinic of Presbyterian Hospital to the clinic staff and studies of how adolescents' choice of contraceptive method is affected by experiencing abortion and by counselors' attitudes towards various contraceptive methods.

The Center for Socio-Cultural Research on Drug Use held an international conference on the Utilization of Research in Drug Policy in May in Washington, D.C., chaired by Dr. Eric Josephson. The proceedings of the conference are due to be published early in 1979.

Dr. Denise Kandel, assisted by Ms. Dorothy Jessop and Dr. Ken Andrews, continued her analyses of the social and psychological determinants and consequences of drug use in adolescence. New activities include: Study of the epidemiology of depressive mood in a representative sample of high school students and their parents; investigation of the interpersonal factors affecting the development of educational aspirations in adolescence; and a new two-year pilot project on drug use among adult women.

Dr. John Colombotos and Ms. Corinne Kirchner continued the data analysis and preparation of a monograph reporting the results of research on physicians' attitudes toward political and health care issues; how these attitudes vary among different age-generations and subgroups of the profession; how physicians' attitudes compare with official policies of organized medicine; and how these attitudes change.

Mr. Paul Haberman began work on a study of the use of health services by American merchant seamen in collaboration with the United States Public Health Service Hospital on Staten Island.

Dr. Schorow engaged in several new areas of research, such as: the effects of prolonged bedrest on mental acuity, as well as muscle strength, and endurance in patients prior to and following surgery; student test-answer changing behavior, the effects of the quality of items (difficulty, discrimination and reliability index) on answer-changing behaviors; and improving the quality of examinations for medical, dental and nursing students.

The Department of Patient Care and Program Evaluation at Harlem Hospital Center, under the directorship of Mr. Morton R. Siegel, analyzed mortality and morbidity figures for the Central Harlem Health District. This district for many years had had the highest rates in New York City of mortality from all causes, age-adjusted mortality from all causes,

and infant mortality. The analysis showed the patterns of mortality and morbidity were not homogeneous throughout Central Harlem. Noteworthy is the contrast of distribution of cardiovascular renal disease and malignant neoplasia as compared with tuberculosis, drug dependence, cirrhosis of the liver, chronic alcoholism, and undetermined injury. This contrast appears to be associated with differences in types of housing and the corresponding lifestyles of residents.

Dr. Dickson D. Despommier continued his studies of *Trichinella spiralis* and has isolated and initially characterized protective antigens from this parasite by a variety of biochemical techniques. Although these antigens are numerous and complex, a few have been isolated in relatively pure form and are protective in microgram quantities.

Drs. Philip A. D'Alesandro and Dr. M. Suzanne Holmes are continuing their studies of the reproduction-inhibiting immunity developed against *Trypanosoma lewisi* in the rat. The responsible antibody, an IgG immunoglobulin, is present on the surface of the parasites during the infection and its amount increases as the immunity becomes stronger. In addition, the antibody is being isolated in a very pure form in milligram quantities and will be used to isolate the eliciting antigen for characterization studies.

Dr. John Frame continued his research in the epidemiology of Lassa fever in Liberia and conducted field studies to determine the distribution and incidence of Lassa virus infections there, to identify convalescents, and to obtain convalescent plasma for a program of vaccine development at the U.S. Army Medical Research Institute of Infectious Diseases. In addition, he is continuing surveys of missionaries for hepatitis and cancer.

Dr. Roger Williams continued his research on mating behavior of mosquitoes as affected by pheromones with attention to coincident anatomical changes in the female. His joint project with the Division of Laboratories and Research and with the Rodent Control Laboratories of the New York State Department of Health on the high incidence of myiasis in domestic rats and its public health significance also continues.

Service and Honors

Dr. Fleiss is program chairman of the Statistics Section of the American Public Health Association for its 1979 annual meeting. He has been named to the Board of the National Commission on Confidentiality of Health Records.

Dr. Fries was elected to the Council of the Health

Applications Section of the Operations Research Society of America.

Dr. ShROUT served as program evaluation consultant to the Harlem Hospital Rehabilitation Center.

Dr. Weinstein was elected to the Institute of Medicine of the National Academy of Sciences. He was also appointed to the Scientific Advisory Board of the International Agency for Research on Cancer of the World Health Organization and the Board of Scientific Counselors, Division of Cancer Cause and Prevention, National Cancer Institute.

Dr. Bruce Dohrenwend served on a task panel on Problems, Scope and Boundaries for the President's Commission on Mental Health. He also was a member of the Social Science Research Training Review Committee at NIMH.

Dr. Curnen served as consultant to the Cancer Registry Program of the New Jersey Department of Health.

Dr. Zena Stein consulted for the World Health Organization in New Delhi, India. She was also a participant in a workshop on the assessment of reproductive hazards in the workplace sponsored by the Society for Occupational and Environmental Health.

Dr. Goldstein was a member of a task force on the epidemiology of respiratory diseases at the National Heart, Lung and Blood Institute. She also served on the steering committee for the National Oceanographic and Atmospheric Administration's Workshop on Human Health and Climate.

Dr. David Rush served as a Research Fellow in the Department of Child Health at the University of Bristol. Dr. Wolf Szmunes was elected Associate Editor of the *American Journal of Epidemiology*. Dr. Ora Fagan served as a reviewer for the National Institute of Law Enforcement and Criminal Justice. Dr. Struening was appointed to the editorial board of a new journal, *Evaluation and the Health Professions*.

Dr. Frances Gearing was a panel member at a workshop titled, "Research, Evaluation and Prevention" sponsored by the New York State Office of Drug Abuse Services. She also served on the planning committee and chaired a task force on evaluation and research at the National Drug Abuse Conference. Dr. Gearing also chaired a subcommittee on drug abuse at the New York Academy of Medicine; served as President of the Greater New York Coalition on Drug Abuse; was a member of a task force on drug abuse formed by the New York Urban Coalition; and was a member of the Board of Trustees of the Daytop Village Foundation.

Dr. Patricia Cohen received the 1978 Raymond Cattell Award for Excellence in Multivariate Re-

search and chaired the NIMH Research Scientist Development Review Committee. Dr. Holger Hansen chaired the Committee on Records and Statistics and served on the Policy and Research Committee of the New York City Amniocentesis Program.

Dr. Wolfe chaired the Finance Committee of the Greater Harlem Nursing Home and the Task Force on Public General Hospitals of the Program Development Board of the APHA. He accepted nomination as First Vice President and President-Elect of the Public Health Association of New York City and was named General Editor for the McGraw Hill Publishing Company Series in Public Health. Ms. Hila Richardson served as a member of the APHA Task Force on Public General Hospitals.

Dr. Lowell E. Bellin served on the Board of the New York County Health Services Review Organization and agreed to serve as a Special Advisor to Dr. Martin Cherkasky, Health Advisor to the Mayor, on problems of the New York City Emergency Medical Services.

Prof. Frank van Dyke is a member of the Health Committee of the Task Force on the New York City Crisis. He also directs the Division of Health Administration's participation in the National Fellowship Retention Program, which provides supervised experience in health administration to minority college undergraduate students in order to encourage them to seek adequate training in health administration.

Dr. Lucie Young Kelly is listed in *Who's Who in America* and in *Who's Who in Health Care*. She was elected as a member of the Board of Directors of the American Nurses Association. She is on the Editorial Board of the *Nurse Practitioner*, Contributing Editor of the *Journal of Nursing Administration* and the Editor-in-Chief of *Image*, the Journal of Sigma Theta Tau. Dr. Kelly was appointed by the New York State Education Department to be a member of the team to review and evaluate the nursing and public health programs of the American University of Beirut, Lebanon.

Dr. Fred Goldman was a Visiting Scholar at the National Bureau of Economic Research and an Editorial Consultant to the *International Journal of the Health Services*. Prof. Michael Ziegler served as a volunteer attorney with the Volunteer Lawyers for the Arts.

The Division of Population and Family Health is responsible for the Young Adult Clinic which provides specialized counseling and contraceptive services to male and female adolescents in Washington Heights with the aim of reducing the high level of unwanted and unplanned pregnancy.

Dr. Martin Gorosh served on the Task Force on

Health, Nutrition and Population for the Conference on Non-Governmental Organizations Symposium in Preparation for the United Nations Conference on Science and Technology for Development to be held in Vienna in August, 1979. Drs. Gorosh and John Ross were consultants to the Ford Foundation on evaluation of the Center for Research on Integrated Service for Mothers and Children in Rio de Janeiro. Ms. Elizabeth Kellner was a member of the Task Force on Latin American Health Workers of the American Public Health Association. She assisted the Margaret Sanger Center in planning seminars on population and related issues for international students in the New York area. Ms. Susan Pasquariella, with the assistance of Ms. Margaret Demarrais, compiled a Sourcebook for the *Second Regional Institute for Training of Staff of Population Resource Centers in Asia and the Pacific*, held in Bangkok, Thailand under the sponsorship of the Association for Population/Family Planning Libraries and Information Centers—International.

Dr. Allan Rosenfield chaired and Dr. Walter Watson served as writer and analyst for the National Research Council of the National Academy of Sciences Panel on Population, Health and Nutrition. Dr. Rosenfield also served on the National Medical Committee of the Planned Parenthood Federation of America, on the Board of the National Abortion Federation, and on the Executive Committee of the Association of Voluntary Sterilization. Dr. Watson was consultant to the IPPF-Western Hemisphere Region on expanding community-based family planning in the Caribbean, especially on Tobago. Dr. Pearla Rothenberg served as evaluation consultant to the Adolescent Health Center of the Door, a comprehensive multiservice center for adolescents in Manhattan.

Dr. Giorgio Solimano assisted the Ministry of Health of the Republic of Panama in the first phase of a joint program to evaluate nutrition projects in the rural areas of Veragua Province. He chaired a National Research Council sponsored conference on "International Assistance for National and Infant Nutrition in Developing Countries." Dr. Solimano was a member of the Task Force on Food and Nutrition Objectives in National Development at the United Nations University's World Hunger Program, and also chaired their international workshop on Nutrition and Food Price Policies in Mexico City.

Dr. Ann Brunswick was named Program Chairperson of the Conference on Social Sciences in Health (American Public Health Association) and served on the advisory group on Adolescent Health, The National Foundation,—March of Dimes. She

also participated in an Invitational Conference on Adolescent Behavior and Health held by the Institute of Medicine in June.

Dr. Colombotos received a Fulbright Research Scholar Award and a Senior International Fellowship from the John E. Fogarty International Center for Advanced Study in the Health Sciences for a comparative study of the power and influence of the medical profession in Greece and the United States. He was appointed Associate Editor, *Journal of Health and Social Behavior*, and Falk Memorial Fund Lecturer, Eastern Sociological Society. He was also re-elected to the Council of the Medical Sociology Section of the American Sociological Association. Dr. Colombotos served as Chairperson of the Annual Conference of the American Association for Public Opinion Research.

Dr. Jack Elinson wrote a chapter on "Prevention" for the Annual Health Report to the President and the Congress of the U.S. He also served on a task force set up by Secretary Califano titled, "Prevention Initiative" through which he developed a national longitudinal study on health habits and health consequences; was appointed to the Board of Directors of the Medical and Health Research Association of New York City and elected Vice-President and President-elect of the American Association for Public Opinion Research. In addition, Dr. Elinson organized and chaired a program at the Annual Conference of Social Science and Health on "General Well-Being of American Adults," and consulted to the Pan American Health Organization on an "Epidemiological Study of Drug Use" in Peru.

Dr. Fisher developed and participated in a computer training program for minority junior high school students and a smoking cessation program for adolescents.

Dr. Sally Guttmacher served as an official participant at the Conference on Nutrition Education held at the University of Dar es Salaam. Ms. Jessop served as a Program Committee member for a Conference on Women and Health in New York City where she organized a session on "The Social Processing of Physical Characteristics and Disabilities," and was elected coordinator of the New York Metropolitan Chapter of Sociologists for Women in Society.

Dr. Josephson served as a member of the Liaison Task Panel in Psychoactive Drug Use/Misuse of the President's Commission on Mental Health. Dr. Kandel was a member of a committee convened in February to advise the NICHD on developing a program of research on the prevention of childhood smoking and excessive drinking. Dr. Kandel was an invited participant for a workshop on Family and Social Environment at the Conference on Adolescent

Behavior, the National Institute of Medicine. She continued to serve as Associate Editor of the *Journal of Health and Social Behavior*; was co-chairperson of the Panel on Health Regulation and Promotion, the National Conference on Health Research Principles; and was appointed to the Committee on Substance Abuse, the National Research Council, National Academy of Sciences.

Ms. Kirchner continued as Editor of the Medical Sociology Section (American Sociological Association) *Newsletter*, and served on a Conference Committee of the American Association for Public Opinion Research, through which she organized and chaired a session on Survey Research on Physical Disabilities at the annual conference. Ms. Kirchner also organized and moderated a session on "The Case for Better Disability Data: Pro and Con" at the American Public Health Association annual meeting.

Dr. Schorow was a member of the National Heart, Blood and Lung Institute Study Panel and the Booth and Jamaica Hospitals Internal Medicine Boards. Ms. Siegmann served as a member of advisory panels to the National Health Planning and Information Center and the Bureau of Health Planning Cost Containment Task Force. She was also a member of the Joint Bureau of Health Planning and National Center for Health Services Research for Health Planning Task Force and on the BHPRD-NCHSR study panel for health planning research grant solicitations.

The Department of Patient Care and Program Evaluation at Harlem Hospital has assisted the Harlem Health Task Force set up by Secretary Califano. The thrust of the involvement has been to try and ensure that proposed service programs are indeed related to actual needs in the community.

Dr. Frame continued as Coordinator of the medical student volunteer program for the Behrhorst Clinic, Chimaltenango, Guatemala. The Division of Tropical Medicine continued to provide consultative and diagnostic services for physicians and clinicians in the Medical Center and the general metropolitan area.

Dr. Desponsmier was elected Teacher of the Year by the second year medical students (Class of 1980), and continues to serve on the editorial board of *Experimental Parasitology*. Dr. Williams continued as a member of the Corporation of the Bermuda Biological Station for Research and served in an editorial capacity for the *Journal of Economic Entomology* and the *Annals of the Entomological Society of America*. Dr. D'Alessandro continues to serve on the editorial board of the *Journal of Protozoology* and as Chairman of the Tropical Medicine and Parasitology Study Section, Division of Research Grants, N.I.H.

1978 Donors

Agency for International Development, American Foundation for the Blind, Inc., Association of University Programs in Health Administration, Florence W. Burden Foundation, Commonwealth Fund, Ford Foundation, General Services Foundation, Health Systems Agency of New York City, W. K. Kellogg Foundation, McGraw Hill, Mellon Foundation, The National Foundation, National Science Foundation, Jesse Smith Noyes Foundation, Pan American Health Organization, Population Council-ICARP, Population Crisis Committee, Rockefeller Foundation, Siam Institute for Mathematics and Society,

United Nations Fund for Population Activities, United States Department of Commerce, World Education.

United States Department of Health, Education, and Welfare: Health Resources Administration, Health Services Administration, Division of Research Resources, National Aeronautics and Space Administration, National Cancer Institute, National Institute of Allergy and Infectious Diseases, National Institute of Child Health and Human Development, National Institute of Dental Research, National Institute of Mental Health, National Institute of Drug Abuse, Fogarty International Center (National Institutes of Health).

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Radiology

WILLIAM B. SEAMAN

Professor and Chairman of the Department • Director of Service

The impact of advancing technology during the last several years had radically altered the scope of diagnostic radiology. It has been suggested that a better and more accurate name would be the department of diagnostic imaging since images are formed not only by x-rays, but by ultrasound, heat and possibly in the not too distant future, nuclear magnetic resonance.

The fourth generation computerized body scanner, developed by Dr. S. Hilal and the American Science and Engineering Company of Cambridge, Mass., has proved to be an effective clinical tool capable of producing images of the highest quality and resolution. The prototype has been installed on the 3rd floor of Presbyterian Hospital and a production model is in use at the Neurological Institute.

Ultrasonography is just beginning to achieve its full potential with the advent of sophisticated real time scanners which enable observation of dynamic phenomena. Automated equipment using water path transmission and larger, multiple transducers result in enhanced resolution and minimization of blurring due to its greater speed. Such equipment is currently being installed in the radiology department.

Cardiovascular radiology is becoming more of a therapeutic modality with embolization to render vascular tumors ischemic and to treat bleeding sites. Dr. W. Casarella and his team have been utilizing angioplasty techniques to dilate stenotic renal and peripheral arteries with remarkable initial success. He hopes to apply these techniques to the coronary arteries.

The logistical problem, in these financially

troubled times, is to keep abreast of these new developments despite a shrinking budget. A plethora of procedures are now available to attack almost any clinical problem and it becomes a difficult problem for the clinician to select the most efficacious procedure that will provide the highest sensitivity and specificity and still avoid duplication and be consistent with maximum economy and patient safety. An indication that the latter problem is of more than parochial interest was the recent National Conference on Referral Criteria for X-ray Examinations, sponsored by Congressman Paul Rogers and the Department of Health, Education and Welfare.

We record with sorrow the death of Dr. John Caffey, Consultant and Professor Emeritus, who was associated with the Columbia-Presbyterian Medical Center from 1926 until his retirement in 1960. Dr. Caffey was considered the world's outstanding pediatric radiologist and the father of this radiologic subspecialty. His book, *Pediatric X-ray Diagnosis*, now in its seventh year, is the most outstanding text in this field.

Teaching

Over 200 physicians attended a postgraduate course on the Radiology of Bones and Joints organized by Dr. Frieda Feldman. Dr. Sadek Hilal arranged a highly successful postgraduate course in neuroradiology with over 300 registrants.

Research

Dr. Kent Ellis and Dr. John Silver are continuing

their detailed study of the normal and abnormal 55 degree chest roentgenogram in order to improve the diagnostic reliability of the plain chest film in the diagnosis of hilar and mediastinal disease. In a related study with Dr. Kristin Thorsen, the value of chest tomography is being compared to that of oblique plain roentgenograms. Regional differences in ventilation are being evaluated by Dr. Ellis on chest roentgenograms taken in varying stages of respiration. The chest roentgenogram, angiocardigraphy and clinical manifestations of hypertrophic cardiomyopathy in children are being analyzed by Dr. Ellis together with Dr. James Shapiro and Dr. Alan Hordof (Pediatrics). Dr. Ellis with Dr. Abraham I. Schaffer, is studying the evolution and significance of coarctation of the aorta.

Dr. John H.M. Austin, and Drs. Y. Enson and H.M. Thomas, III (Medicine) are correlating the radiologic and physiologic manifestations of patients with interstitial lung disease. Drs. R. Mattern and John H.M. Austin with Dr. A.W. Branwood (Pathology), are investigating the risk factors in pulmonary thromboemboli. Dr. W. Casarella with Dr. Hymie Nossel (Medicine) has continued to study catheter thrombogenicity and the basic physiology of blood thrombosis, including the biochemical mechanisms of thrombosis and their relationship to clinical problems. Dr. Casarella has embarked on a clinical study of percutaneous angioplasty which involves the non-operative dilatation of arterial stenosis by means of balloon catheters. Over 40 cases of varying types and sites of arterial stenoses and occlusions have been treated by this new technique.

Dr. Frieda Feldman and Dr. Howard Kiernan (Orthopedic Surgery) are evaluating the accuracy of arthrography in comparison to arthroscopy in the delineation of the manifestations of joint disease.

Continuing research in the physics of computed tomographic scanning, especially the problem of spectrum hardening corrections, is being carried out by Dr. Peter M. Joseph in corroboration with Drs. S. Hilal and F. Kelcz. Dr. Joseph is also quantifying xenon and other substances, using computed tomographic scanning.

Dr. Ascherl, in collaboration with Drs. Martin G. Luken, James W. Correll and S.K. Hilal, are reviewing the clinical aspects and angiographic features of all cases of spontaneous dissecting aneurysms of the extracranial carotid artery. Dr. John Silver with Drs. P. Johnson, R. Fawwaz and T. Wang of the section of nuclear medicine are investigating technetium diphosphonate absorption by malignant ascites. Dr. Johnson, with Drs. Fawwaz and P. Esser and Drs. C. Steeg and R. Boxer (Pediatrics) are evaluating a non-invasive radionuclide technique to quantify left-

to-right cardiac shunts. Dr. Johnson, with Dr. Esser and Dr. N. Braun (Medicine), has completed a clinical assessment of Krypton-81m gas for pulmonary ventilation imaging. Drs. Johnson and Esser have completed their study of simulated fluorescent imaging of the thyroid. With Dr. T. Hardy (Surgery) Drs. Fawwaz and Johnson continue to assess a method to differentiate predominantly cellular from predominantly humoral renal allograft rejection. Drs. R. Fawwaz and M. Hardy continue their investigation of systemically administered hematoporphyrin labeled with Pd-109 as an immunosuppressive agent to prevent heart homograft rejection in the rabbit. With Dr. DeBellis (Medicine) Dr. Fawwaz is pursuing a method to detect early bone marrow toxicity due to chemotherapy. Drs. R. Fawwaz, P. Esser and T. Wang also initiated a study of the effect of dimethyl sulphoxide on the tissue distribution of various pharmaceuticals. Dr. P. Esser introduced a significant improvement in the computer program for shunt detection, organ size and regional ventilation. Dr. T. Wang continues his studies of the affinity of diphosphonic acids and related compounds for living bone. With Drs. Edelson and Burger (Dermatology), Drs. Johnson and Wang investigate white blood cell labeling with Indium-111 oxine and other radionuclides. Drs. S.K. Hilal, S. Ganti and John Silver, in collaboration with Drs. Petersen and Michelsen (Neurosurgery) are studying computerized tomography in subarachnoid hemorrhage due to aneurysm.

Dr. D. King has been developing a new system for computer reconstruction of three-dimensional ultrasonic images of the heart. He has been able to create three-dimensional models of the left ventricle derived for spatially located two-dimensional echocardiograms.

Drs. H. Rossi and Y. Lam made further improvements to the formulation of the Theory of Dual Radiation Action, which describes the quantitative relationship between biological events such as carcinogenesis and cell killing, with radiation dose and quality. Dr. E. Hall made comparative biological measurements at clinically used neutron therapy centers in Houston, Cleveland and Washington, as well as at The Hammersmith Hospital in London. He continued experiments to test the efficacy of the new generation of drugs which sensitize hypoxic tumor cells to the effects of radiation. Dr. C. Geard is comparing the biologic effect of monoenergetic neutrons with charged particles. Dr. Carmia Borek is carrying out experiments in which fresh explants of hamster embryo cells are irradiated to score the frequency of malignant transformation. She has compared the effects of neutrons and x-rays as well as the action of chemical promoters and inhibitors. Dr.

Richard Miller carried out experiments with an established cell line to score the frequency of malignant transformations produced by radiation and chemical carcinogens. Dr. Paul Kliauga and Leon Goodman performed experiments with the high energy beams of carbon, neon and argon produced by the BEVALAC at the Lawrence Berkeley Laboratory, and measured the pattern of energy. Dr. Marian Biavati is engaged in measuring energy absorption patterns at the nanometer level.

Drs. Hilal and Sane are continuing the intravascular embolization project in collaboration with Dr. Jost Michelsen (Neurosurgery) and with the addition this year of Dr. Janecka (Head and Neck Surgery). The research project has resulted in the development of newer types of silicone rubber, suitable for intravascular injection. They have also developed under this program a new type of silicone rubber that expands by the formation of foam after its administration. Most of the work in this project has addressed vascular malformations of the brain, the spinal cord, and tumors of the head and neck.

A study of the regional cerebral blood flow by the inhalation of stable xenon is being conducted by Drs. Hilal and Kelcz (Anesthesia) and Drs. Quest, James Correll and Jost Michelsen (Neurosurgery). The purpose of this project is to study in a true three dimensional geometry, the regional blood flow of the brain by inhaling stable xenon and using the CT scanner.

The development of a high resolution total body scanner was completed during this year, and resulted in a fourth generation scanner featuring the stationary detector system. This innovation from the group based at Columbia-Presbyterian Medical Center has changed the entire CT industry; which has adopted this design. This project was a collaborative effort of all the sections in the Department of Radiology.

The inter-institutional study of brain tumors with CT and nuclear scanning is in the fifth year. The project is under the direction of Dr. Hilal and Dr. Brisman (Neurosurgery).

Dr. Ascherl and Dr. Shultz (Neurosurgery) have completed a study on cerebral cysticercosis occurring in the immigrant population. Dr. Ramaiah Ganti, in collaboration with Dr. Kadis are studying the *tuberculum sellae* and *planum* meningiomas. Dr. Ganti and Dr. David Kvam (Neurosurgery) are also studying posterior *fossa* meningiomas. Dr. Whelan, in collaboration with Dr. Hilal, has completed a study on the diagnosis and follow-up care of brain abscesses. Dr. Whelan and Dr. Zyroff are collaborating with Dr. Correll and Dr. Stern (Neurosurgery) on vertebral basilar insufficiency relieved by carotid surgery. Dr. Kelcz has completed a study on the noise con-

sideration in dual energy CT scanning in collaboration with Dr. P. Joseph. The purpose of this project is to establish whether it is possible to do a chemical analysis using the CT scanner.

Radiotherapy Statistics

	1978	1977
No. Treatments	21004	22396
No. Patients	1207	1311
No. Fields treated	32793	

Staff Activities and Honors

The role of the radiology department in the national scene is well exemplified by the number of faculty who serve on editorial boards of medical journals, including the following:

W.B. Seaman, *American Journal of Roentgenology*, *Gastro-intestinal Radiology*, *Hospital Practice*, *The American Journal of Diagnostic Gynecology & Obstetrics*; K. Ellis, *American Journal of Roentgenology*; W. Casarella, *Cardiovascular Radiology*; S. Hilal, *Journal of Computer Assisted Radiology*; D. King, *American Journal of Roentgenology*, *Journal of Ultrasound*; D. Baker, *Radiology*; W. Berdon, *Pediatric Radiology*; E. Hall, *Radiation Research*, *International Journal of Radiation Oncology*; H. Rossi, *Radiation Research*.

Dr. William B. Seaman was re-elected vice-president of the Board of Chancellors of the American College of Radiology. Walter Berdon was elected president of the Society for Pediatric Radiology. David Baker became president of Eastern Radiological Society. Frieda Feldman and Philip Johnson continue as examiners for the American Board of Radiology. Kent Ellis was elected secretary and John Austin program chairman of the Fleischner Society. Kent Ellis continues as a member of the publications committee of the American Roentgen Ray Society and a member of the Board of Directors of the North American Society for Cardiac Radiology. He is vice chairman of the Council on Cardiovascular Radiology of the American Heart Association.

Dr. Edith Quimby, emeritus professor, received the gold medal at the annual meeting of the American Society of Therapeutic Radiologists.

Dr. Eric Hall is a member of the NIH Radiation Study Section.

Dr. William Casarella was elected president of the Society of Cardiovascular Radiology. He was also elected to the executive committee of the Faculty Council and to the executive committee of the Council on Cardiovascular Radiology of the American Heart Association.

Dr. Fred Kelcz was awarded a Picker Scholarship.

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Rehabilitation Medicine

JOHN A. DOWNEY

Simon Baruch Professor and Chairman of the Department • Director of Service

The development of basic and clinical research in the Department of Rehabilitation Medicine has been a long term goal. A most significant step to this goal was the recruitment of Dr. Lucien Cote as Associate Professor of Rehabilitation Medicine and of Neurology to be Director of Laboratories and Research in Rehabilitation Medicine. Dr. Cote has been actively involved in obtaining space, remodeling the laboratory and recruiting faculty and staff into the laboratory.

The Department, through the generosity of an anonymous donor sponsored the production of an educational film entitled "I Had A Stroke." This film, second in a series, shows the events and rehabilitation of a stroke on several patients and has met with wide approval from patients and their families, medical students and other health professionals. It is now available for rental or purchase.

Dr. Albert D. Anderson, a distinguished and active member of the Department and Director of Rehabilitation Medicine at Harlem Hospital, was nominated as the first A.D. Gurewitsch Professor of Clinical Rehabilitation.

Miss Denise Vandervliet was named Chief Physical Therapist at Presbyterian Hospital, and Dr. I.A. Sutherland resigned her appointment to move abroad.

Teaching

Members of the Department again participated as preceptors in the Physician-Patient Relationship course for first year medical students. Drs. Moldover, Sutherland and Myers were involved, with Dr. McCagg assisting.

Through the assistance of the J.M. Foundation, the summer student program in Rehabilitation Medicine was considerably expanded, as a program for undergraduate students, students just entering medical school, and students completing their first year was instituted. This program was under the supervision of Drs. Sutherland, McCagg and Schlesinger and provided varying experiences for the students depending upon their level of experience. A total of approximately fifteen students were involved. The undergraduate students participated as counsellors at Hidden Valley Camp for handicapped children. The students entering medical school in the fall rotated to various clinical facilities for a broad introduction to Rehabilitation Medicine. The students completing their first year of medical school spent most of their time on the Rehabilitation Medicine floors at this Medical Center and affiliated hospitals. All students met together several times per week for didactic and review sessions. This course was very well received by the students and will be continued in the future.

Because of changes in the first and second year curriculum, only the lecture portion of the Introduction to the Patient Course was given this year and continues to be well received. The group sessions were also enjoyed by the students and felt to be significant benefit. They will continue to be given although there has been no definite commitment as of this date by the curriculum committee.

The Third Year Clinical clerkship has been revised and systematized so that all of the students have as much of a similar experience as is feasible. A course syllabus has been set up as well as an examination.

Student responses to this revised aspect of the course are more favorable than in previous years. A proposal has been submitted for a separate time slot for the third year course in Rehabilitation Medicine when the new curriculum changes for the clinical years will be made.

The elective program for senior medical students is becoming more popular both with students from the College of Physicians & Surgeons and from outside medical schools, this year there were five students from the College of Physicians & Surgeons and one student from Wayne State University.

Dr. Gonzalez has assumed the responsibilities of resident recruitment and has been highly successful in obtaining a full complement of highly qualified residents. He is, in addition, director of Residency Training and Educational Program in the Department and has developed a new curriculum as well as extending teaching with our Departments.

The Didactic Teaching Program has continued as before, but in addition, the residents attend a whole day teaching conference held in other Medical Centers, once a month. Residents continue to participate in the Gross Anatomy Laboratory dissection and teaching of medical students.

Residents now join with the Neurology and Neurosurgery residents for Neuroscience lecture series to be held for three months on Saturday mornings.

Research

Dr. Larry Crawshaw, Assistant Professor in Rehabilitation Medicine and Pharmacology joined our research staff during the past year. Dr. Crawshaw is a well-known and highly regarded investigator in comparative physiology with special interest in temperature regulation. He brings to our research program new perspectives and techniques with which to investigate a large number of basic and clinically relevant problems encountered in Rehabilitation Medicine. Experiments by Dr. Crawshaw and his assistant, Mr. Dan Lemons, are in progress to assess changes in metabolic rate, food intake, and activity levels of fish entering winter torpor.

Much of our research focuses on problems commonly associated with aging. Drs. John Downey, Raphael Jewelewicz, Lucien Cote, and Larry Crawshaw are investigating the possible alterations in temperature regulation mechanisms associated with hot flashes seen in menopause. They are measuring skin and core temperature, sweating, limb blood flow, blood catecholamines, and several pharmacologically active polypeptides in plasma during hot flashes.

Dr. Stanley J. Myers' pain study research project

continues. The investigation of the effects of acupuncture compared with a standard analgesic agent such as APC and codeine has been completed and the results presented at the 40th Annual Assembly of the American Academy of Physical Medicine and Rehabilitation in New Orleans. The use of this pain model will be expanded for the study of other analgesic agents and further investigations into neurophysiological effects of electrical stimulation are underway.

The joint project with the Department of Medicine and Psychiatry on the cardiovascular and autonomic affects of the tricyclic antidepressant effects is proceeding on schedule. Investigation of the peripheral autonomic affects of two major tricyclic drugs on blood flow, heart rate and blood pressure, following tilting, cold and mental stimuli are being studied. Dr. Myers and Mr. Dick Bruno, a graduate student, are the main investigators.

Equipment has been received for the investigation of somatosensory evoked responses. Preliminary studies are underway investigating cerebral and spinal cord evoked responses in patients with various neurologic conditions and in patients undergoing spinal cord surgery. The major investigators in this project include Drs. Myers, N. Singh (Department of Neurology), and S. Deli (Department of Neurosurgery).

Dr. Erwin Gonzalez has completed a study on the incidence of fracture following amputation. He was assisted by Dr. Mathai Mathew. Also completed is a pylon study for early ambulation among amputees. Dr. Farhad Nowroozi co-authored this paper. At present, Dr. Gonzalez is conducting studies on Cerebral Evoked Potential and Spinal Cord Monitoring during Scoliosis Surgery in cooperation with the Department of Orthopedics and Research on Strength Development using Shortening versus Lengthening Contraction with Georgia Reidel, R.P.T.

Dr. Jonathan Moldover is studying the cardiac response to various forms of exercise in an attempt to establish guidelines for the rehabilitation of patients with combined cardiac and neuro-muscular disabilities. Often patients with heart disease and disabilities, such as hemiplegia, paraplegia, or amputation, are deterred from receiving active rehabilitation because of our lack of knowledge of the physical tolerance which can be allowed with these disabilities before cardiac symptoms appear.

Dr. Caroline McCagg is conducting research in Cardiac Rehabilitation. This is funded by the Heineman Foundation and its purpose is to assess the results of an in-patient exercise and educational program for uncomplicated myocardial infarction pa-

tients. Mr. William DeTurk, R.P.T. is the participating Physical Therapist responsible for designing and implementing the cardiac exercise program. They are working in conjunction with the Departments of Nursing and Medicine.

Dr. Gregory Florant, a post-doctoral student and member of our research staff, is taking part in a study to evaluate and compare the mechanisms of temperature regulation in young versus old healthy individuals. Parameters such as the initiation of sweating, shivering, changes in core and skin temperature blood flow in limbs, plasma catecholamines will be continuously monitored during changes in ambient temperature in young and elderly healthy subjects. Based on a sparse number of clinical reports, thermoregulation mechanisms appear to be impaired in the elderly exposed to excessive heat or cold, leading at times to serious complications and even death.

Dr. Lucien J. Cote and associates are studying changes, during senescence and in disease states, in the activities of the enzymes involved in the synthesis and degradation of neurotransmitters in human brain obtained at post-mortem. They find profound decrease in activities of the enzymes necessary to make catecholamines such as tyrosine hydroxylase and DOPA decarboxylase, during the middle age (40-50 years of age). On the other hand, enzymes involved in the synthesis and degradation of other neurotransmitters in the brain such as acetylcholine, gamma aminobutyric (GABA) show a much more gradual decline with age. Dr. Cote and colleagues are purifying glutamic acid decarboxylase (GAD) from brain in an effort to study its basic properties and also to generate antibodies to this enzyme in experimental animals. Antibodies to GAD, the enzyme which synthesizes GABA, provide a powerful, histochemical tool to specifically localize GABAergic neurons in brain and gave us new insights as to its role in both normal and abnormal states. In Dr. Cote's laboratory, antibodies to human astrocytic fibrillary protein were generated in experimental animals. Studies are being done with this antiserum, to assess the turnover of fibrillary astrocytes in disease states and in aging. Drs. Cote and Phillip E. Duffy (Neuropathology) are investigating the activity of superoxide dismutase in fibroblast maintained in culture for various periods of time. Drs. L. Cote and Leon Kremzner (Neurology) are investigating the rate of turnover of monoamine oxidase and acetylcholinesterase in brains of mice as related to age.

Patient Care

At Presbyterian Hospital the Clinical Service has been increasingly active. Dr. Caroline McCagg has been named Director of In-patient Services and the

service has maintained a very high occupancy throughout the year.

Programs in Occupational and Physical Therapy

Major changes in Occupational Therapy course curriculum have been made in the areas of instructional methodologies in anatomy, human growth and development, therapeutic activities and modalities, clinical pathology, psychopathology and health administration. In 1978 a 15-hour seminar on gerontology was added to the curriculum. An Allied Health Project grant has been funded for three years, its focus is to build on past accomplishments to develop additional graduate programs at the advanced Master's level, and to do a feasibility study concerning establishment of a doctoral degree.

Fund raising for minority, disadvantaged and handicapped students has been realized by contributions made by physical therapy alumni. As a result, the G.E. Miller, Inc. Scholarship Gift Account has been established and continues with the generous support of Mr. George J. Miller. In addition, two federal government fellowships were received from the Graduate and Professional Opportunities Program. A Basic Physical Therapy Educational Program leading to a Master of Science has been submitted to the university for review. A three year grant to improve quality of physical therapy education was approved by the Division of Associated Allied Health Professions of the Department of Health, Education and Welfare. Physical Therapy will be involved in grant funded projects to study preschool education for the handicapped child. Allied Health Improvement Grant to Occupational and Physical Therapy for clinical and academic faculty development.

Blythedale Children's Hospital

Dr. Challenor was elected to serve on the Board of Directors of the American Association of Electromyography and Electrodiagnosis as well as serving as Program Chairman for the New York Society of Physical Medicine and Rehabilitation. She holds membership on their Continuing Medical Education Committee.

Dr. Kathleen Watson was the U.S. Team physician to the Cerebral Palsy games held in Edinburgh, Scotland, as well as serving as Chairman of the Medical Committee for the National Association of Sports for Cerebral Palsy in 1978.

Helen Hayes Hospital

Helen Hayes Hospital continues to be an important and highly rated teaching service for both residents

and students. The staff also actively participate in the in-service teaching sessions at P&S.

St. Luke's Hospital

December 1978, marked the retirement of Dr. S.H. Yue as Director of the Rehabilitation Medicine Service. Dr. Yue concluded his Acupuncture Research Project and is in the process of finalizing the results. Ms. Bernadette Hecox, Assistant Professor Physical Therapy, investigated the effects of dance therapy for the physically disabled. Biofeedback for the relief of hypertension and for muscle rehabilitation is being studied by Dr. Keith Sedlacek and Dr. Ravi Malpe, respectively.

Harlem Hospital Center

Dr. Anderson was honored at "Albert D. Anderson Day" at Harlem Hospital Center citing his contributions to the Service since being named its first Director. The Rehabilitation Medicine wing of the Martin Luther King, Jr. Pavilion was named after Dr. Anderson. Dr. Thornhill was appointed to the State Board for Massage by the Regents of the University of the State of New York.

Honors and Achievements

Dr. John A. Downey was guest lecturer at the International Congress of Rehabilitation Medicine in Basle and invited speaker at the 11th International Study Group on Child Neurology and Cerebral Palsy at Oxford, England. Dr. Y. Challenor and Dr. N. Low also presented papers.

Dr. Myers was invited to participate in a symposium on Back Pain at the College of Physicians and Surgeons. The title of the talk was "Electrodiagnostic Considerations." He also spoke on Pain, Nature and Nurture, A Physiatrist's Viewpoint at the Eastern Section meeting of the American Academy of Physical Medicine and Rehabilitation at St. Vincent Hospital, New York, on May 20, 1978. Dr. Myers participated as a senior medical advisory member, of the National Wheelchair athletic Association at the Tri-state Wheelchair Games in Nassau County, L.I., and at the Woodrow Wilson Rehabilitation Center in Virginia. He was appointed by the President of the Association of Academic Physiatrists to a Liaison Committee between the AAP and the American Board of Physical Medicine and Rehabilitation.

Dr. Erwin Gonzalez is the President of the New York Society of Physical Medicine and Rehabilitation. He was elected Chairman of the New York Medical Society, Section of Physical Medicine and Rehabilitation, then elected Chairman of the Liaison Council of Physical Medicine and Rehabilitation

Societies of the American Academy of P.M.&R.

Mrs. Cecilia Macauley, Nurse Coordinator, Harlem Hospital Center, was the recipient of a World Health Organization Fellowship which permitted her to study in England for one month at Stokes-Manville Hospital. Her interest was in their approaches to the care of the spinal cord injured patients, for which this Hospital is best known.

Miss Marie-Louise Franciscus, O.T.R., has been reappointed by the Regents of the University of the State of New York to the State Board for Occupational Therapy for a five year term.

Ms. Nedra Gillette, O.T.R., presented papers on The Implications of Specialization for the Profession of Occupational Therapy at the AOTA Annual Conference, and Practice, Research and Education at a special meeting of the AOTA Representative Assembly.

Ms. Barbara Neuhaus was elected to the position of Regional Representative to WHO for World Federation of Occupational Therapists. She is responsible for coordinating WFOT/UN activities.

Ms. Diane Shapiro, O.T.R. delivered a keynote address on the Role of Occupational Therapy Personnel, at the Wisconsin Occupational Therapy Association Annual Conference.

Ms. Laura Hoffman was appointed Program Chairman for the annual meeting of the American Society of Hand Therapists. Ms. Lauralee Hawkins has been involved in a continuing education program for nurses on Nursing Management of the Patient with a Stroke—Rehabilitative Principles. Mrs. Ann Edgar was awarded a National Arthritis Foundation Grant to study hip and knee involvement in children diagnosed as JRA.

Acknowledgements

The encouragement and support of the Anonymous donor has permitted us to continue implementation in all of our clinical and research programs as well as projecting their expansion.

The previously inaugurated educational programs sponsored by Mrs. H. Lawrence Bogert and the J.M. Foundation having proven greatly successful continue to receive their sponsorship. We look forward to the expansion of our work in the education of the principles of Rehabilitation Medicine to the undergraduate, graduate and medical student via this sponsorship.

Mrs. Dorothy Scott of the Neurological Institute Auxiliary has continued to work toward making our Recreational Program a success, permitting expansion of staffing to a full time position. This program has proven essential not only to the rehabilitation

patient but to all in-patients in Neurological Institute.

Our research in the areas of thermoregulation and cardiac status evaluation were greatly aided by the support of the Chichester DuPont Foundation as well

as by Mr. & Mrs. Simon Rose and the Heineman Foundation in the area of cardiac evaluation and rehabilitation.

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Surgery

KEITH REEMTSMA

Valentine Mott Professor and Johnson and Johnson Professor and Chairman of the Department • Director, Surgical Services

With the Presbyterian Hospital undergoing a dramatic change in administration and management style, the 1978 year has been one of consolidation and planning. Members of the staff have been involved extensively in many phases of budgeting and program development which we expect to yield important results in the future of the institution.

Of particular importance to our future has been the addition to the staff of one of the nation's most distinguished plastic surgeons. Dr. Thomas J. Krizek, who had been Chief of Plastic Surgery at Yale, has been appointed Chief of our Division of Plastic and Reconstructive Surgery. His appointment is major evidence of a new vitality developing within the department. We are, in addition, strengthening our department in other clinical areas and research programs.

Undergraduate Teaching

Under the chairmanship of Dr. Philip D. Wiedel, the Education Committee has been responsible for the direction of the Department's undergraduate educational programs.

First Year:

The organization of the Department's participation in the teaching of Gross Anatomy has continued to be carried out by Dr. Alfred Jaretzki III. This year, members of the Department at the affiliated hospitals have assumed an expanded share of this responsibility. Dr. Jaretzki has also continued to organize and monitor a series of Correlation Clinics, which illustrate the relevance of anatomy to the solution of clinical problems.

Members of the Department also served as preceptors in the course on Doctor-Patient Relationships.

Second Year:

Dr. Wiedel planned and monitored the Department's participation in Abnormal Human Biology. Dr. Frederick O. Bowman organized the surgical portions of the section on Cardio-Pulmonary Disease, Dr. Frederic P. Herter that for Oncology and Dr. Paul Lo Gerfo those on Gastro-Intestinal Disorders.

Third Year:

Dr. Robert G. Bertsch continued as Course Director for the Surgical Clerkship. During this six-week period, students are assigned in groups of five or six to each of the three General Surgical Services. A member of the Department is assigned as preceptor to each of these groups and monitors their participation in the activities of the Service. The students play an active role in the diagnosis and treatment of patients and also attend didactic sessions of instruction in surgical pathology, thoracic surgery, and radiology as it pertains to surgery. The syllabus, which serves as a guide to teaching in this clerkship, underwent a major revision during the past year.

Fourth Year:

Dr. Henry Spotnitz has continued to direct and monitor the elective courses for fourth year students. Surgical subinternships at Presbyterian and affiliated hospitals, as well as at other university hospitals, have continued to be in strong demand. Students have

also spent elective periods in the research laboratories of members of the Department and in the Surgical Pathology laboratory.

Graduate

The House Staff Committee is continuing its efforts to maintain flexibility in our program as we strive to adapt to the varying career plans of our residents. Twelve house officers are selected each year from a highly competitive pool of applicants. These residents enter into a two-year program designed to prepare them either to move on to a surgical specialty or to continue their general surgical training. Most of those choosing to finish a general surgery program continue in our program for three further years of training culminating in a year as senior resident where extensive opportunities for independent operating and leadership exist. Five seniors presently complete the program each year. Those desiring further graduate training at this institution may compete for graduate residencies or fellowships in thoracic and cardiovascular surgery, pediatric surgery, plastic surgery, and vascular surgery. A special training program in academic surgery is offered to one unusually qualified and productive resident each year. House officers training in our program are expected to carry a significant continuing responsibility for the education of their colleagues and the third and fourth year medical students with whom they work. The dictum that residents learn best by teaching is one which guides much of the planning for our program.

The House Staff Committee's membership is made up of Dr. Thomas C. King, Chairman, Dr. Kenneth A. Forde, Dr. Ivo Janecka, Dr. Paul Lo Gerfo, Dr. Roman Nowygrod, Dr. John Schullinger and Dr. Henry Spotnitz, with the PGY 4 and PGY 5 residents as ex-officio members.

Postgraduate

The Department's postgraduate educational program continues to be coordinated by Dr. Jose M. Ferrer, who also serves as Associate Dean for Postgraduate Education.

Postgraduate efforts in Continuing Medical Education were expanded in the Department during 1978 and now total eight programs which are approved for Category 1 Credit for the Physician's Recognition Award of the AMA. These eight programs were as follows:

- 1) Surgery Lecture Series—weekly at C.P.M.C.
- 2) Mechanical Support of the Failing Heart—a one day post-graduate course under the direction of Dr. David Bregman of the Thoracic Surgery Division, C.P.M.C.

- 3) Burn Deformities, Prevention and Correction—a one day postgraduate course under the direction of Dr. James E. C. Norris of the Harlem Hospital Plastic Surgery Division.
- 4) Combined Staff Conferences of the Thoracic and Cardiac Surgical Service—monthly conferences at C.P.M.C.
- 5) Surgical Service Trauma Conferences—a monthly trauma conference designed to cover all aspects of surgical trauma during each academic year, C.P.M.C.
- 6) Current Concepts in General Surgery—a five day postgraduate course given at St. Luke's Hospital under the direction of Drs. Hugh Fitzpatrick and Howard Nay.
- 7) What's New in Surgery?—a one day postgraduate course given at Harlem Hospital Center under the direction of Dr. Harold P. Freeman.
- 8) Combined Infectious Disease Surgical Conferences—a series of ten monthly lectures on infectious disease in surgical patients, Harlem Hospital Center.

During the year, eight lectures at five community hospitals were given by eight members of the surgical faculty as a part of the Continuing Medical Education Program for Community Hospitals.

Research

Surgical Metabolism Program

The Surgical Metabolism Program, under the direction of Dr. John M. Kinney, has continued research in areas related to gas exchange, ventilation, energy metabolism and tissue fuels. This clinical and animal research has involved the integration of three parts: the clinical activities of the Surgical Metabolism Unit in Presbyterian Hospital, directed by Dr. Frank E. Gump; the metabolic laboratories directed by Dr. David H. Elwyn; and the data processing activities directed by Robert Foster. A dedicated team of nurses, headed by Irene McLeod, along with dietitians Mary Iles and Yvonne Schwartz, provide a controlled environment for both patient care and clinical investigation. Dr. Yvon Carpentier from the Hopital Saint-Pierre at the University of Brussels has continued his Fulbright/NATO fellowship, specializing the study of lipid metabolism in injury and infection. This work has been pursued in collaboration with Drs. Jules Hirsch and Robert Burr of the Rockefeller University. Dr. Jeffrey Askanazi has continued his work in spirometry on the Metabolic Unit, while completing a residency in Anesthesiology. Dr. Joseph Milic-Emili, Chairman of the De-

partment of Physiology at McGill University, has served as both consultant and collaborator on the spirometry studies. Dr. Otto Szekely is on a Swedish Fellowship and studying the use of supine exercise as a safe, reproducible stimulus to ventilation. This is in the hope that loss of ventilatory reserve which is not evident at rest might be revealed by a detailed analysis of subtle changes in the breathing pattern during standardized exercise.

1. *Calorie/Nitrogen Interrelations*—Dr. Elwyn has directed a detailed study in depleted surgical patients receiving total parenteral nutrition, where a constant nitrogen intake was studied with three different levels of carbohydrate intake. Important data was obtained to support the concept that nitrogen balance is more closely related to the balance, than to the intake, of calories as is commonly presented. Dr. Hamish Munro, Professor of Physiological Chemistry at MIT, has served as consultant and collaborator on these studies. Future corresponding studies with higher levels of nitrogen intake will be undertaken and the effect of substituting intravenous lipid for part of the carbohydrate calories will be examined in this type of patient.

2. *Glucose Kinetics in Injury and Infection*—Previous studies from this program have demonstrated that glucose turnover in the acutely ill surgical patient was increased and isotonic glucose by peripheral vein did not abolish this response as it does in normal volunteers. A follow-up study has been completed this year which has shown that much higher glucose loads can inhibit the increased turnover rate of glucose in injury and infection, but that the carbohydrate abnormalities of injury and sepsis are not abolished simply by giving large amounts of carbohydrate as part of total parenteral nutrition.

3. *Lipid Metabolism in Injury and Infection*—The concentration of circulating glycerol has been shown to have a linear relationship to glycerol turnover in normal man. Dr. Carpentier has utilized a novel infusion technique, devised by Hirsch and Burr, for measuring glycerol turnover. Patients undergoing hip replacement, whose post-operative nutrition for 4 days was limited to isotonic glucose or amino acids by peripheral vein, were shown to have a dissociation of the glycerol concentration and turnover rate, the latter being sharply increased by the operation. Since the release of glycerol is a direct measure of triglyceride breakdown in adipose tissue, studies are being initiated with tracer fatty acids to determine the proportion of fatty acids which accompany the glycerol into the blood stream and hence, by difference, to determine the fatty acids made available by triglyceride breakdown, but which are reesterified without leaving the adipose tissue. Such

studies are expected to shed light on how fat is mobilized during injury and infection and, ultimately, how total parenteral nutrition can be expected to modify endogenous fat mobilization.

4. *Muscle Amino Acids and Postoperative Nutrition*—The protein breakdown and increased nitrogen excretion which characterizes the response to injury and infection is largely at the expense of muscle protein. Therefore, the Swedish technique of percutaneous needle biopsy of muscle has been utilized to study the influence of intravenous nutrition on the postoperative pattern of muscle amino acids. This study has been performed on patients undergoing total hip replacement in collaboration with Dr. Christopher B. Michelsen and Dr. Frank E. Stinchfield of the Department of Orthopedic Surgery, and with Dr. Jeffrey Askanazi of the Department of Anesthesiology. Data on the free amino acids of muscle and plasma of postoperative patients receiving infusions of glucose, amino acids, or both, reveal characteristic alterations in skeletal muscle, and to some degree plasma. It appears that these changes may represent the first intracellular evidence in muscle of the systemic protein catabolism which is the hallmark of injury and infection.

5. *Non-Invasive Spirometry and Gas Exchange*—A unique canopy-spirometer-computer system has been perfected over the past decade which allows for prolonged, continuous measurements of gas exchange and spirometry without the use of a mask or mouthpiece. Studies have been completed during the past year which provide an improved characterization of normal, supine breathing and its association with gas exchange. Detailed measurements of gas flow and timing of subdivisions of each breath have been made in acutely ill, hyperventilating patients. These indicate that recording tidal volume, respiratory rate and minute ventilation fails to focus on the mean inspiratory flow and inspiratory time as a fraction of each breath. Dr. Jospeh Milic-Emili of McGill University has emphasized that these latter variables are more fundamental in the control of ventilation. Detailed studies of changes in the pattern of breathing and gas exchange are currently underway in patients receiving carefully controlled amounts of curare. These studies are being conducted by Dr. Jeffrey Askanazi, Dr. Stanley Rosenbau and Dr. Allen Hyman of the Department of Anesthesiology. A separate investigation is underway to examine the extent of CO₂ loading which is provided by the high carbohydrate loading of total parenteral nutrition and to determine the circumstances in which this may provide a greater load than the patient's compromised ventilation can handle during some acute episode associated with injury or infection.

6. *Effects of Bed Rest*—Introductory studies have been initiated by Dr. Thomas C. King, Dr. Eric Rose and Dr. Hannibal Edwards to examine the psychological and physiological changes associated with periods of bed rest, such as accompany the hospital care of many surgical conditions. New methods have been developed for psychomotor and muscle function testing which appear to be applicable to the hospitalized patient.

Hepatic Regeneration

Two problems in hepatic regeneration were investigated by Dr. John B. Price, Jr. during the last year. Inbred Lewis rats were used in both studies. Auxiliary transplantation of a liver placed in tandem with the host liver was carried out so that the outflow from the transplant went directly to the portal venous inflow of the host liver. The experiments were designed to show evidence for humoral factors arising in the transplant that could either stimulate DNA synthesis or inhibit previously initiated DNA synthesis in a partly resected host liver. No evidence for initiating or inhibitory factors arising from the liver was developed. No *in vivo* experiments have ever given clear cut, reproducible evidence for humoral factors arising from the liver, although it has frequently been postulated that they exist.

To investigate the site of origin of factors initiating hepatic regeneration, normal rats were cross-circulated with either hepatectomized rats with the gastrointestinal tracts present, or hepatectomized rats without the gastrointestinal tract. Hepatic regeneration as measured by DNA synthesis was initiated in the normal rats paired with hepatectomized rats with gastrointestinal tracts, *but* a greater response was seen in the normal rats paired with the portally eviscerated, hepatectomized animals. An initiating factor for hepatic regeneration of non-portal origin was thus demonstrated. This is in accord with previous work from this laboratory showing that factors of portal origin (glucagon, insulin and others) are important modifying agents but do not initiate hepatic regeneration.

Cancer and Cell Physiology

Dr. Carl Feind and Dr. Paul Lo Gerfo are investigating the value of tumor markers in the detection of thyroid cancer. During the past year they have demonstrated that serum thyroglobulin is extremely sensitive in detecting recurrent thyroid cancer in the athyroid individual. This assay is at least as sensitive as radioactive scanning for the detection of recurrent disease and works in individuals regardless whether their tumor is able to concentrate iodine or not. In patients with metastatic thyroid cancer, Drs. Feind

and Lo Gerfo have shown that serum thyroglobulin levels will fall in some individuals when they are placed on exogenous thyroid suppression. They believe that this form of thyroid cancer suppression test will enable them to predict those patients whose cancers will respond well to exogenous thyroid administration alone. Several patients with metastatic thyroid cancer have begun treatment with a specific form of immunotherapy directed at thyroglobulin. These individuals are being auto-immunized with a human form of altered thyroglobulin in the hopes that they will develop auto-immunity to their thyroglobulin producing cancer.

In addition, purified antibodies to thyroglobulin are being evaluated as carriers for cytotoxic drugs and radionucleotides in the treatment of patients with metastatic thyroglobulin producing cancer. During the next year they hope to have some results regarding the clinical effectiveness of specific immunotherapy in humans.

Oncology

Dr. David V. Habif continued as coordinator of the oncology program which is in the developmental stage. Miss Rita Lipton, the supervisor of the oncology office played a major role in helping to establish the Medical Center's Tumor Registry by completing in excess of 300 minimal cancer data set forms of patients with new cancers for entry into the cancer center's computer. Starting in 1979 she will supervise the completion of all research data forms for new cancer patients and will institute follow-up analysis and retrieval of pertinent data through a computer terminal in the surgery oncology office. Emphasis will be upon patients with breast, colon, thyroid and lung cancer.

Drs. David V. Habif, Kari Cantell, Raffaele Latte, Myron Tannenbaum and Miss Rita Lipton treated another patient who had metastatic carcinoma of the breast. They demonstrated that leukocyte interferon given intralesionally into a skin metastasis resulted in eradication of all of the cancer cells by lysis and that mock interferon injected into another skin metastasis had no effect. This is the third patient who had a carcinolytic response to intralesional leukocyte interferon and the first in the world to have mock interferon. This response suggests that the anti tumor effect of interferon is due to the interferon and not to the impurities in the vehicle.

Drs. Fredric P. Herter and Nathan Lane are analyzing the histological features of Duke's B carcinoma of the colon with a view to aiding in the selection of patients for adjuvant therapy. Drs. Herter and Barbara Low are studying bile obtained at operation of patients with colorectal cancer to learn if the

hypothesis is correct that the degradation products of bile acids may be carcinogenic.

Drs. Edmund N. Goodman and Bernard Sandler and Mrs. Miriam Messner initiated an experimental study of detection of malignant tumors of the breast by electrical DC potential measurement using small subcutaneous electrodes introduced through syringe needles.

Drs. John M. Kinney, David H. Elwyn, Mark A. Hardy and Paul LoGerfo continued their studies of investigating the nature of catabolism in patients with cancer by analysis of intracellular amino acids.

Laboratory of Immunogenetics

The following research projects have been pursued over the past year in the Laboratory of Immunogenetics directed by Dr. Nicole Suciu-Foca:

1. HLA-Genetics

A) Genetic Fine Structure of the HLA Region

The laboratory has provided the first evidence that HLA-D and DR antigens are coded by different loci. This discovery is unanimously recognized as being of utmost importance in view of its implications for the understanding of: 1) mechanisms of allograft rejection and 2) mapping of disease susceptibility genes linked to HLA.

B) The Genetics of LD₂. Estimation of Gene Frequency.

Research studies have provided the first description of the polymorphism of LD₂. New methods of testing and genetic analysis have been developed to this effect. LD₂ antigens stimulate the allogeneic recognition process and may thus contribute to the immunogenicity of allogeneic grafts.

2. HLA and Transplantation

A) The Role of HLA Antigens in Allograft Rejection.

The laboratory staff has investigated the development and specificity of anti-HLA antibodies during humoral rejection of kidney allografts. These studies demonstrate that the process of acute fulminating and chronic rejection is mediated by antibodies directed against HLA-DR antigens. The detection of monospecific anti-DR antibodies provides a sensitive tool for predicting the onset of humoral rejection and differentiating it from reversible episodes of acute cellular rejection. Anti-SD (HLA-A,B,C) antibodies develop with progression of the rejection process, fluctuate in titer and specificity and appear to be of restricted value for immunological monitoring purposes.

3. HLA as Differentiation Antigens

It has been demonstrated that human T-lymphocytes primed against allogeneic antigens acquire HLA-D and DR antigens which are normally present only on B but not T cells. These antigens therefore appear to be differentiation antigens whose expression might be related to the regulation of the immune response. Pointing to the same conclusion, it has been found that antibodies directed against specific DR antigens appear in the circulation of (nontransfused, male) patients with carcinoma of the gastrointestinal tract.

4. HLA and Disease Association Studies

A) Juvenile Diabetes Mellitus and the HLA System

Pursuing the study on the genetics of JDM, Dr. Suciu-Foca has discovered that the JDM gene is closer to HLA-DR, and that it is in linkage disequilibrium with DRW3 and DRW4 rather than with the corresponding HLA-D antigens. DRW3 and DRW4 homozygotes, as well as individuals heterozygous for both these genes, are at significantly higher risk to develop JDM, than heterozygotes carrying only one of them. This further confirms the theory that JDM is inherited as a recessive trait, and permits the assessment of relative risk for members of JDM families with different HLA types.

B) HLA Studies in Patients with the Guillain-Barre Syndrome

In collaboration with the Neurological Institute, the staff has investigated the possibility that the Guillain-Barre Syndrome, an apparent viral disease, might prevail in patients with a certain HLA phenotype. No linkage disequilibrium with any HLA-A,B,C or D antigen was found.

C) HLA Studies in Patients with Carcinoma of the Breast

A search for linkage with HLA in carcinoma of the breast was made by investigating multiple case families in which the disease had occurred in at least two generations. The data exclude the possibility that the "disease susceptibility gene" might be within a distance of 0.05 – 0.2 cM from the HLA region.

Transplantation

The Transplantation Program under the direction of Dr. Mark A. Hardy, has completed its third year of clinical, teaching and research activities. The clinical

productivity has increased in renal transplantation with the development of affiliations with satellite dialysis units and some increase in the number of recipients. Donor organ procurement under the direction of Dr. William Dobelle is being organized as a major activity of the Transplantation Program and has already made this aspect of transplantation more feasible. Heart transplantation has become a clinical therapeutic modality in the past year for carefully selected patients and the organization of this part of the program has been accomplished effectively in collaboration with the Divisions of Cardio-Thoracic Surgery (Dr. Keith Reemtsma) and Cardiology (Dr. Ronald Drusin). In the past year, initial parathyroid transplants have been performed into hypoparathyroid patients by Dr. C. Feind without immunosuppression, after organ culture. This effort will continue in the coming year and will serve as a model for endocrine transplantation, particularly that of pancreatic islets in diabetes mellitus.

The Transplantation Program has at the same time continued a major effort in collaborative research programs with other departments in the areas of immunobiology.

At the clinical level, the role of anti-thymocyte globulin in the prevention of early rejections in kidney and heart recipients has been demonstrated. Clinical randomized study has begun on the effectiveness of anti-thymocyte globulin in the reversal of acute rejection episodes. This has been strongly suggested by a pilot study done in the past year. Studies on detection of early allograft rejection are continuing and have shown an important use of C-reactive protein as a marker, and have also demonstrated the usefulness of radionuclide studies (Ga and Tc-S-colloid) in differentiating cellular and humoral rejection (with Division of Nuclear Medicine—Dr. Rashid Fawwaz and Dr. Philip Johnson). Improvements of immunologic monitoring are being developed and special tissue typing studies with emphasis on the role of anti-B cell antibodies are being conducted in collaboration with Dr. N. Suci-Foca and the Immunogenetics Laboratory. Basic research on the role of donor pretreatment in a rat heart transplant model has already been applied to donor pretreatment in clinical heart transplantation and will be expanded to a randomized clinical study in kidney transplantation in the coming year. Active collaborative efforts have continued with the Department of Pathology (Dr. Conrad Pirani and Dr. Fred Silva—kidney; Dr. John Fenoglio—heart) in immunopathologic studies.

The teaching activities of the Program have been expanded to include rotating surgical fellows from Harlem Hospital and one to two senior medical stu-

dents per year who spend their elective period in the laboratory.

In the coming year, the Transplantation Program expects to continue its busy schedule by increasing the number of renal transplants to 35 and heart transplants to 12. The addition of Dr. Gerald Appel as Director of Hemodialysis should increase the number of potential renal recipients. A major effort will be made to initiate a clinical liver transplantation program and to organize a liver failure support system in collaboration with the Department of Medicine. This should be facilitated by the development of the Donor Organ Procurement Center under the direction of Dr. William Dobelle.

Endocrine Transplantation

As part of its total development, the Transplantation Program has continued a major effort in the development of endocrine organ transplantation at the experimental level. The main thrust of this part of the program is to develop practical and successful pancreatic islet transplantation for amelioration of juvenile diabetes mellitus and prevention of its vascular complications.

Research on pancreatic islet transplantation is progressing well. In the past year it has been clearly demonstrated in the animal models that successful islet transplantation can prevent renal complications of diabetes as well as many of the metabolic changes. Models have been developed for allografting of islets which may have practical applications in patients. The major effort has been on selecting a site for implantation of islets and from the recent research it appears that intramuscular implantation, which would be the simplest method in patients, is practical in experimental animals. It has become clear in the past that the major effort has to continue in increasing the efficiency of islet isolation, particularly in the large species. To that end, a separate effort has been mounted to develop consistently high yields of pancreatic islets from large animals and man by physical and chemical means. A parallel effort has begun to successfully allograft and xenograft islets without the use of continuous immunosuppression in the recipients, but rather by development of chimeras and induction of partial tolerance. Pancreatic islet research is truly an interdepartmental effort with close collaboration among the Departments of Surgery, Medicine, Pathology, and Neurology.

In addition to the effort in pancreatic islet transplantation, initial efforts at parathyroid allotransplantation into hypoparathyroid patients have been initiated in the past year in collaboration with Dr. C. Feind. The major impetus to this part of the program

has been the great interest in the role of passenger leukocytes and endocrine organ cultures in prevention of allograft rejection. Studies in the laboratory of human parathyroids in culture suggest that there is a marked depletion of passenger leukocytes and the preliminary clinical results are promising in that the tissue is not violently rejected by the host and occasionally is fully accepted. Work on this subject is continuing, with major emphasis on laboratory studies of alteration of immunogenicity of the relatively homogeneous parathyroid organ cultures. This will have major implications not only for parathyroid transplantation, but particularly for pancreatic islet transplantation and the transplantation of other endocrine organs.

In the coming year the studies on pancreatic islet cell transplantation will continue to be vigorously pursued and clinical studies on parathyroid transplantation will continue parallel with careful analyses of immunologic mechanisms of rejection in patients and animals. In addition, studies are planned on other endocrine organs, particularly the adrenal gland and the thyroid.

Colonoscopy

Dr. Kenneth A. Forde has continued his activity in flexible fiberoptic colonoscopy with increasing demands for the procedure as it has become an accepted part of the physician's armamentarium in managing colonic disease, including the periodic examination of patients on treatment protocols under the aegis of the Oncology Service. He participates in the training of the Gastroenterology Fellows of the Department of Medicine and several general surgical residents who have spent part of their elective period in endoscopy. Interdisciplinary conferences with the Departments of Medicine, Radiology and Surgery are held throughout the year.

Special areas of concentration this year have included: refining sampling techniques such as cytology and biopsy (for example, "blind" direct brush cytology and mucosal biopsy in chronic inflammatory bowel disease for detection of early precancerous changes); evaluation with Radiology (Dr. William Seaman) of colonoscopy as a complimentary evaluatory technique to the barium enema in selected situations; development of a technique of colonoscopic examination of the patient with acute rectal bleeding.

We look forward to moving from our temporary quarters to a larger area when Phase II construction of the new Gastro-intestinal Endoscopy Suite (adjacent to the Radiology Department) has been completed. At such time close collaboration on various studies with the Departments of Medicine and Radiology will be more feasible.

Cardiac Surgery Research

Preservation and support of ventricular function continue to be topics of prime interest. Potassium cardioplegia is under intensive study. In cooperation with the Department of Medicine, eight patients with intraoperative myocardial ischemic arrest exceeding two hours have been studied six months after surgery by radionuclide angiography. The results support the safety of cardioplegic arrest techniques. New data on intraoperative counterpulsation in adults and children is being accumulated by Dr. David Bregman. Drs. Reemtsma, Bregman and Richard Edie have continued research in cardiac transplantation.

Function of the Hancock porcine valve prosthesis has been carefully reviewed, with no pattern of mechanical failure apparent thus far. Drs. James Malm and Donald Syracuse reviewed factors influencing mortality in reoperation for prosthetic valve failure. Drs. Malm, Frederick Bowman and Edie continue to study complex reconstructive procedures for congenital heart disease. Drs. Eric Rose and Henry Spotnitz have developed a computer program for regulation of intraoperative anticoagulation, based on measurement of activated clotting time.

Basic research in the operating room includes studies of electrophysiology of human atrium and electrical mapping of the sinus node, conduction system, and arrhythmias in cooperation with the Department of Pharmacology. Dr. Spotnitz has demonstrated reversible decreases in left ventricular compliance in patients with ischemic arrest periods in excess of one hour; correlative studies of effects on ventricular mechanics are in progress. Drs. Spotnitz and Calvin Wong have demonstrated decreased left ventricular ejection fraction by intraoperative echocardiography after valve replacement for mitral regurgitation, confirming unfavorable effects of acutely increased afterload on left ventricular function.

In the Cardiovascular Surgery Research Laboratory, Drs. Rose, Charles Marrin, Bregman and Spotnitz have completed an intensive analysis of the effects of current mechanical assistance techniques on left ventricular function. The computerized analysis of ventricular mechanics employed for this investigation will subsequently be applied to clinical studies. Drs. Alan Benvenisty, James Avery, Marrin and Spotnitz completed studies demonstrating the efficacy of dopamine, dobutamine, isuprel, and glucagon individually and in selected combinations in chronic canine beta adrenergic blockade. Drs. Marrin, Rose, Spotnitz and Bregman demonstrated a new technique for cardiac assistance based on synchronized injection of Bolus into the contracting left ventricle. Drs. Marrin, Dennis Arena, John G. Napoli and Spotnitz demonstrated a technique for

regional monitoring of changes in ventricular compliance.

Five year renewal of the Pharmacology-Surgery Program Project Grant will support intraoperative studies of effects of counterpulsation on left ventricular mechanics. Dr. Spotnitz received an NIH Research Grant for application of two-dimensional ultrasound to problems in cardiac surgery. The Laboratory is also the recipient of research support from the American Heart Association, the New York Heart Association, and Eli Lilly. During 1977-78, three fourth year P&S students, two members of the Surgical House Staff, and four college undergraduates were engaged in research activities in the Laboratory.

Intensive Care

A major investment of expertise from both the Anesthesia and Surgical Services has continued to focus on the jointly directed Surgical/Anesthesia Intensive Care Unit (SAICU). Drs. Allen Hyman (Anesthesiology) and Thomas C. King (Surgery) provide the primary consultative direction for the full-time professional complement of six residents at various levels of seniority. Sophisticated and complex monitoring equipment and close attending staff supervision have produced an extraordinarily good record of salvage in a wide variety of critically ill patients, many of whom are referred to this hospital with catastrophic surgical complications. The unit is used not only to take care of the critically injured or sick patient, but also for short-term prophylactic admissions for selected high-risk patients during their early post-operative period. The growing capabilities of our staff surgeons in performing more complex surgical procedures in more critically ill patients, cardiac transplantation for example, make us increasingly dependent upon this unit.

Vascular Flow Laboratory

This year, the second that the non-invasive flow laboratory has operated as a clinical testing unit, has been one of progressive expansion. Its services are now utilized by both medical and surgical outpatient and inpatient departments to assist in the diagnosis and management of peripheral arterial and venous disease and extracranial carotid artery disease. Under the direction of Drs. Arthur B. Voorhees, Jr. and Roman Nowygrod, technicians Barbara Fee and Gene Martino are now performing scheduled and emergency evaluations in the recently refurbished PH 12 laboratory and portable studies at the patient's bedside.

Utilizing the techniques of segmental plethysmography, treadmill stress testing and doppler ultrasound

evaluations of upper and lower extremity arterial occlusive disease, thoracic outlet syndromes, and Raynaud's Disease can be performed as for diagnosis and pre- and postoperative patient management with minimal discomfort and no morbidity. Venous occlusion plethysmography, used to assess patients for deep vein thrombosis, has proved most beneficial in screening out patients with normal studies who might otherwise require phlebography and/or anticoagulant therapy. Oculoplethysmography and carotid phonangiography have proved useful in evaluating asymptomatic carotid artery bruits, in screening patients with transient ischemic attacks for carotid angiography, in evaluating patients with atypical neurologic symptoms for carotid artery disease and in following patients after carotid endarterectomy.

In addition to expanded clinical activity, the Flow Laboratory is currently participating in two ongoing clinical studies. The first, under the auspices of the Angiography and Vascular Service divisions, is an evaluation of intraluminal angioplasty for the treatment of peripheral arterial occlusive disease. The second is a study of Surgical Anesthesia Intensive Care Unit patients investigating changes in peripheral venous resistance in critically ill postoperative patients.

Emergency Room/Ambulatory Care

Ambulatory care has been a major focus for hospital wide planning this year. In conjunction with architectural consultants, new plans have been developed for refurbishing the VC 1 physical plant, for streamlining patient flow through the medical-surgical emergency areas, for the development of a physician run triage unit and for a short stay unit adjacent to Area A under joint surgical-medical supervision. Responding to needs for improved triage and emergency patient care delivery, the department has moved the surgical distributor to Area B where patients with non-urgent surgical problems are seen on an appointment basis. In addition, a direct referral system to the Whipple, Lockwood, Blake-more, Breast and Thyroid Clinics has been instituted to reduce waiting times, eliminate multiple clinic visits and free the Area A staff for more expeditious management of emergency problems. To improve teaching and on-site supervision, daily morning patient review and teaching conferences have been instituted and senior level residents have been assigned to Area A on a 24 hour basis. An emergency room encounter form developed after a year of planning and revision is now in use and is expected to help substantially in monitoring patient care delivery and generating accurate census data.

Clinical Affairs

The Clinical Affairs Committee, under the chairmanship of Dr. Alfred Markowitz, has met regularly throughout the year. Each clinical service, including the nursing service, has had representatives to present and discuss various problems regarding patient care.

Despite the difficulties caused by the closing of the 12th floor in Presbyterian Hospital, we have managed to maintain high quality care of our patients. The surgical resident staff, nursing staff and our clinical clerks deserve accolades for their devoted service despite many difficulties.

We look forward with hope and confidence for new and modern facilities to care for our patients.

Blakemore Service

The Blakemore Service, the focal point of vascular surgery in the Department, has completed its fourth year of clinical teaching and research activities. The clinical productivity has continued to increase by encompassing over 600 major vascular procedures and delivering an estimated 1,800 related consultations. A vascular surgical registry founded two years ago has continued to expand and present a current disease profile as it exists in the Presbyterian Hospital.

The service, under the direction of Dr. Arthur B. Voorhees, Jr., has continued a strong commitment of collaborative research programs with members from the Departments of Medicine and Psychiatry.

The relationship of renal ischemia to hypertension has long been an interest of Dr. Joseph Buda. An ongoing collaborative clinical research program with Dr. Leslie Baer of the Hypertension Center is continuing to assess the accuracy of pre-operative patient selection and recurrent disease evaluation by angiotensin II blockade studies.

A continuing experimental program defining the humeral and nutritional factors which control liver regeneration is being conducted by Dr. John Price. A more thorough understanding of these factors has immediate clinical application in the area of surgical revascularization of the liver and in partial resection of liver for trauma or neoplasm.

Studies of peripheral arterial control through the voluntary control of biofeedback loops regulating blood vessel diameter are being undertaken in collaborative research conducted by Dr. Kenneth Greenspan (Psychiatry) and Dr. Arthur B. Voorhees, Jr. (Surgery). Current focus is a controlled study of patients with severe peripheral arterial insufficiency.

Lockwood Service

The Lockwood Service, under the direction of Dr. Frank E. Gump, represents the focal point for endocrine surgery and metabolism in our Department. The diagnosis and treatment of breast disease continues to represent a major clinical activity for this Service. The establishment of a Tumor Registry during the past year has made it possible not only to enter information but to lay the groundwork for expanded clinical studies. At this time a comparison of modified and radical mastectomies is underway in the hope of resolving the continuing controversy regarding the best treatment for early carcinoma of the breast. The Lockwood Service has had long experience with both procedures and it is now possible to evaluate 10 year results. The critical problem of staging will be facilitated by unique techniques of axillary lymph node clearing that have been routine in the Surgical Pathology laboratory.

Other aspects of breast disease are also under investigation. Drs. Sven Kister and Darrow Haagensen are continuing their efforts to identify patients with breast cancer by means of a tissue and blood marker derived from cyst fluid protein. Drs. David Habif and Kister also closely follow a group of patients shown to have lobular neoplasia on biopsy in an effort to detect the possible development of breast cancer at an early stage. The effort to identify patients with a familial tendency to develop carcinoma of the breast is another ongoing project of the Lockwood Service.

Surgery of the thyroid and parathyroid constitutes another major clinical area. Drs. Carl Feind and Paul Lo Gerfo are progressing in the effort to employ immunotherapy in the treatment of thyroid carcinoma. Once the thyroid gland has been removed, an autoimmune thyroiditis can be produced in thyroglobulin-producing metastases.

Dr. Bashir Zikria has had a long interest in the surgical treatment of morbid obesity. At this time, almost 100 patients have been treated by jejunoileal bypass procedures and the results of this work have recently been reviewed. In addition, selected patients are now being treated by gastric bypass now that the technical problems of this surgery in massive obesity have been alleviated by the use of stapling devices. Metabolic abnormalities are far more easily managed in the gastric bypass patients since they do not have malabsorption.

Whipple Service

The Whipple Service has continued under the direction of Dr. Alfred M. Markowitz during the present academic year.

The clinical clerkship on this active surgical service has continued to be highly attractive to third year medical students where they form an integral part of the clinical team. The fourth year elective in gastrointestinal surgery offered by Dr. Markowitz has resulted in interesting investigations by students in such areas as carcinoma of the rectum secondary to radiation of the uterine cervix and management of functional islet cell hyperplasia of the pancreas.

Drs. Frederic Herter and Markowitz are continuing their review of neoplasms of the gastrointestinal tract as part of Dr. David Habib's cooperative study of neoplastic disorders.

Drs. Collin Weber, Herter and Reemtsma have undertaken preliminary clinical experiments in transplantation of pancreatic islet cells in humans in appropriate subjects.

Dr. Kenneth Forde's colonoscopy suite remains very active, serving both as a most important service to the patient and as an important training ground for our resident staff.

Dr. Thomas King has recently joined the Whipple Service. This will now allow for a concerted study of hiatus hernia and diseases of the esophagus.

The entire attending staff has gained considerable experience in its use of the newer stapling techniques in gastrointestinal anastomoses, and all are able to use the instruments with expertise and authority.

The Whipple Service continues its cooperative study with the Department of Medicine in the management of bleeding disorder of the gastrointestinal tract.

Chest Surgical Service

The Chest & Cardiac Service, under the direction of Dr. James R. Malm, has expanded its role in student teaching and has enlarged its research facilities and opportunities for research training. The clinical service continued to perform an increasing number of operations for complex congenital and acquired cardiac disease.

The thoracic and cardiac attendings participate in the first year anatomy program under the chairmanship of Dr. Alfred Jaretzki, and contribute two seminar days to the abnormal human biology course in the second year. A weekly chest surgical conference in the format of a preceptor session is held for the students during the clinical year. Three electives are offered to the fourth year students, including a sub-internship and two post-graduate preceptorships.

The keystone of the service is its outstanding residency program in thoracic surgery and its expanding cardiac surgery program. A teaching program for residents and attendings is held for at least one hour a day and once a month a combined Saturday confer-

ence takes place which is well attended by members of the affiliated hospitals and other visitors. This has been advertised as "the best thoracic and cardiac show in town." All residents in the program participate in at least one clinical or research paper and attend one national thoracic meeting. The clinical program is uniquely developed to provide total cardiac surgical care in congenital heart disease, acquired heart disease, and more recently, cardiac transplantation. This is the only program in New York State which provides all these clinical facilities.

At the present time the service is in the planning stage of developing a cardiac center, in collaboration with the Departments of Medicine, Pediatrics and Radiology. The goal of this program is to provide comprehensive cardiac care within the concept of a tertiary care facility.

An annual luncheon is held by the service during the meetings of the American Association for Thoracic Surgery. This has become an important reunion for all the graduates of the program and gives them the opportunity to renew friendships and exchange scientific data. The Presbyterian Heart Club has been active in inviting former patients, particularly pediatric patients and their families, to return to this hospital for a reunion. This occasion is used to promote good fellowship and initiate fund raising projects. It is a particularly rewarding experience for the doctors and their patients.

Former house staff, nurses, technicians and medical students are cordially invited to participate in any of these teaching activities listed and to maintain their ties to the medical center.

Pediatric Surgical Service

The clinical material and operative experience of the Pediatric Surgical Service, under the direction of Dr. Thomas V. Santulli, continues to increase, particularly in the fields of neonatal surgery and oncology. The transfer of high-risk newborn infants to Babies Hospital through the Western and Upper Manhattan Perinatal Network and from other institutions has provided a broadening exposure to neonatal surgery for the Service. The survival rate in the small premature infant in this high-risk group has been most encouraging and has been due in large measure to our close association with and the cooperative efforts of the Neonatology Service of the Department of Pediatrics.

Dr. Santulli continues to serve on the Surgical Committee of the Children's Cancer Study Group of the National Institute of Health. Dr. John Schullinger was reappointed Chairman of the Publications Committee of the American Pediatric Surgical Association.

Dr. Howard Ginsburg, Chief Pediatric Surgical Resident, and Dr. Santulli are reviewing all of the cases of neuroblastoma which have been seen at the Babies Hospital, in preparation for an updated report on our experience with this most common solid tumor in the pediatric age group.

Dr. Ginsburg and Dr. Charles Vinocur, our Senior Pediatric Surgical Resident, together with Dr. John Schullinger and Dr. Barbara Barlow are investigating the effect of splenic irradiation upon the spleen's contribution to immunity in the rat model. The purpose of these investigations is to define this contribution and to identify any differences between splenectomy and splenic irradiation on the various pathways for combating infection, including opsonization.

Plastic Surgery Service

With the retirement of Dr. George F. Crikelair, the oldest continuously operating Plastic Surgical Residency Program in the United States experienced a year of major transition. Dr. Thomas J. Krizek became chief of the service after ten years as Professor and Chief of the Division of Plastic Surgery at the Yale-New Haven Medical Center.

The major focus of the Division is on resident education. Two residents are appointed each year for two years training in preparation for certification by the Board of Plastic and Reconstructive Surgery. The Division also shares the responsibility for training the general surgery house staff.

Dr. Crikelair is continuing his work in tumor immunology and immunotherapy, and his collaboration with Dr. Melvin L. Moss (Anatomy and Dental and Oral Surgery) on facial bone and cartilage growth.

Dr. Francis C. Symonds, Jr., acted as Director of the Division through September 1, 1978 while continuing his development of methods for repairing exstrophy of the bladder, reconstructing major chest wall defects, and lower eyelid deformities.

Dr. Bard Cosman is working with laser therapy of port wine stains. He has received national recognition and has donated an argon laser to the Columbia-Presbyterian Hospital for use in the operating room for treatment of this and other conditions. He continues work on steroid therapy for keloids and cleft palate surgery. He recently completed a teaching course on "The Constricted Ear," at the annual meeting of the Plastic Surgical Society. His versatility was recently recognized when he received the Second Prize for Sculpture in the New York Physicians Art Association's Annual competition.

Dr. Ivo P. Janecka has developed a fine microsurgery laboratory where he is working on embolization (with silastic glue) for hemorrhagic condi-

tions. The laboratory also serves as a main teaching resource.

Dr. Krizek brings to the Division a long interest in surgical bacteriology and the management of contaminated wounds. Studies (in association with Dr. Charles L. Fox, Jr.) are underway incorporating anti-bacterials into a variety of biologic dressings. Dr. Krizek is also investigating the influence of local host environmental factors on aging rates of heterochronic transplants.

CLINICAL CARE—PRESBYTERIAN HOSPITAL 1978

(One operation per patient)

	Private	Ward
Heart—Chest inc. Babies	245	
Plastic	581	316
G.I.	397	87
Colonoscopy		
Diagnostic	237	
Polypectomy	92	
Other therapeutic	2	
Upper G.I. Endoscopy	6	
Gallbladder-Pancreas	243	62
Appendectomy	44	62
Rectal	173	25
Breast	744	36
Hernia	332	55
Thyroid	218	6
Other Abd.	225	76
Vasc. Misc	677	118
Pediatrics	387	225
Head-Neck	99	14
	4365	1077
Colonoscopy +	337	
	4702	

The Mary Imogene Bassett Hospital

The Surgical Service continues under the direction of Dr. David A. Blumenstock. The function of the Surgical Service was complicated this past year by the unexpected death of Dr. Thomas P. Ashford, general and vascular surgeon. Dr. Ashford's talents as a teacher and surgeon were well recognized and will be sorely missed. Vigorous recruiting for a replacement is underway.

The undergraduate teaching program in surgery provided elective experience for twenty Columbia students during the year. While a newly created Office of Medical Education serves as a clearing house for student and house staff related matters, Dr. Bruce MacDonald has been appointed to oversee the Surgical Student Program. Dr. Roger MacMillan continues as coordinator of surgical residency affairs. In

the area of postgraduate education, many of the Hospital's conferences now qualify for Category I credit for the staff and for surrounding physicians.

Dr. Blumenstock continues research studies in mismatched allotransplants of the lung in irradiated beagle animals reconstituted with autologous bone marrow. A considerable number of long-term survivors are now available for study of the immunologic mechanisms leading to the prolonged allograft survival. In addition, the Histocompatibility Laboratory continues studies of the immunogenetics of the dog and is providing tissue typing services to a number of investigators in the major medical centers around the United States.

The Clinical Cancer Program identified 382 new cancers exclusive of skin in the past year. The Surgical Oncology Program, under the direction of Dr. John E. Olson, is continuing collaborative studies with the Eastern Oncology Group and with other groups in experimental chemotherapy protocol. The 98% follow-up of our Tumor Registry and its existence for over twenty years makes the registry an important research instrument.

The clinical importance of nutrition in surgical patients has been acknowledged and a multidisciplinary team of dietitians, pharmacists, and physicians has been assembled and is under the direction of Dr. James Bordley IV.

The clinical service has experienced an almost doubling of the number of neurosurgical procedures since the addition of Dr. Bruce Harris to our Neurosurgical Staff last year. Increasing numbers of multitrauma patients make up a portion of this increase. Dr. Edward J. Carey, Jr., orthopedic surgeon, was appointed to the Regional Committee on Trauma, of the American College of Surgeons.

As a result of suggestions by representatives of the Joint Commission on Accreditation of Hospitals, detailed definitions of surgical privileges were worked out for the members of the department this past year. Also the increased need for documentation of quality of care resulted in an expansion of our monitoring of patient records. This task has been directed by Dr. Robert W. Mackie, of our staff.

It was a pleasure for the members of the department to host a visit by Dr. Keith Reemtsma, our department chairman. While here he conducted rounds, met with members of the department, and gave two formal lectures on heart transplantation and pancreatic transplantation.

Harlem Hospital Surgical Service

The Surgical Service at Harlem Hospital Center continues under the direction of Dr. Harold P.

Freeman. During the past year, the service has focused on the cancer problem in the Harlem community. Statistics on all major cancers seen at Harlem Hospital dating back to 1965 have been compiled. The studies indicate an alarmingly high five year mortality among cancer patients seen at this hospital. A satellite out-patient breast cancer screening clinic is being established. The funding for this clinic was provided by Governor Hugh Carey who visited Harlem to make the presentation. Dr. Freeman will be the Project Director. A separate grant has been obtained from the American Cancer Society to set up a free cancer screening clinic within Harlem Hospital. Hopefully, with these added facilities and with an intense community educational program, we will make some impact on the cancer problem.

The Surgical Service conducted a cancer symposium with the assistance of the American Cancer Society in June 1978. Papers were presented on Breast and Gynecological Cancers.

A symposium entitled "What's New in Surgery at Harlem Hospital Center" was conducted in November 1978. Among other papers, the Pediatric Surgical Section under Dr. Barbara Barlow presented its findings on "Preservation of the Traumatized Spleen & Gastro-Esophageal Reflux in First Year of Life." The Urology Section under Dr. Harold

Overlook Hospital

Our affiliation with the Overlook Hospital has continued to mature during 1978. Dr. Richard W. Brenner is director of the surgical service where a wide variety of general, pediatric, thoracic and vascular surgical procedures are carried out. The success of the Columbia-Presbyterian Medical Center resident Gurnes presented its study on "Needle Aspiration Biopsy in Cancer of Prostate." The accuracy of this technique was shown to be equal to that of Perineal Punch Biopsy.

Dr. David Carberry, Chief of Thoracic Surgery, presented data supporting the use of "Open Thoracotomy in Emergency Room Resuscitation."

Dr. Freeman served as Visiting Professor in the Department of Surgery of the Pahlavi University School of Medicine in Shiraz, Iran. He also received the Catholic University of America Annual Award for Outstanding Achievement in the Field of Medical Arts.

The rotations to the Presbyterian Hospital in transplantation, cardiac surgery and pediatric urology have been maintained. Residents from Harlem Hospital also rotate to the Memorial Hospital for Cancer and Allied Diseases. The affiliations have substantially augmented our training programs.

rotation has resulted in an expansion for the coming year during which one 4th year and two 2nd year residents will spend 3 month rotations at Overlook. As a result of the Columbia University affiliation, first year residency slots on the surgical service are filled by rotating residents preparing to continue the Ob & Gyn, Psychiatry, and Anesthesia programs at Columbia-Presbyterian Medical Center.

The surgical service at Overlook, with 16 general and thoracic surgeons and 45 surgeons in other surgical specialties, continues to emphasize the teaching of surgical patient care and, therefore, has a primarily clinical emphasis. An increasing number of Columbia P&S medical students are electing rotations here.

At present, there are two residents from the Urology Service rotating at the third and fourth year levels through Overlook Hospital for four months at a time.

The affiliation with Columbia-Presbyterian Medical Center's Surgical Service, as well as the St. Vincent's affiliation, enhances the excellence of surgical care and education at Overlook to our mutual advantage.

The Roosevelt Hospital

The Surgical Service of the Roosevelt Hospital concluded a very active year under the direction of Walter A. Wichern, Jr., M.D. The primary emphasis continues to be excellence in patient care and the teaching of medical students, residents, and fellows.

Despite significant demographic changes in the community, the volume of clinical material available for teaching remains high with approximately 14,000 surgical procedures accomplished. There were gratifying significant increases in general surgery and the surgery of trauma.

The surgical staff participated enthusiastically and devotedly in all the activities of the service, contributing much valuable time and talent, functioning, indeed, as full time personnel. The service continued to do exceedingly well in the National Resident Matching Program and the surgical house staff continues to be of the highest quality and a source of much pride.

The inter-reaction of the excellent house staff and a devoted attending staff creates an ambience that is most exciting, enthusiastic and enviable.

The surgical house staff of thirty-two assimilated into their services as sub-interns medical students from the College of Physicians & Surgeons, and eight other medical schools in a most effective and stimulating way. A course in surgical technique was given all first year house officers, rotating medical students, as well as those in special need.

A great effort has been made to respond to a recognized community and hospital need to reorganize

and rebuild the emergency room. Plans are now complete and we are hopeful that this will be actualized in the immediate future.

Thirty-two papers were published in the surgical literature by members of the staff. Research continues in several areas, in particular in patient monitoring, joint replacement, microvascular surgical techniques and newer applications of microfibrillar collagen. A videotape cassette teaching library of surgery of the hand was completed by Dr. J. William Littler and his staff, and one of general surgical techniques is in preparation.

St. Luke's Hospital

Under the direction of Dr. Hugh F. Fitzpatrick, the Surgical Service had a very high occupancy rate during 1978 and performed somewhat more than 13,000 surgical operations. Eight hundred and six patients underwent cardiac surgery utilizing total cardiopulmonary bypass. This was the largest number done by one institution in New York State. The mortality rate of 2.8 percent was the lowest in the state. For coronary bypass operations without valve replacement or ventricular aneurysm resection, the operative mortality rate was 1.6 percent, again the lowest in the State of New York.

The number of fourth year medical students applying to join our Surgical Service has steadily increased and in 1977 we submitted 125 names to the National Intern Matching Program.

Dr. Richard B. Stark resigned as our Chief of Plastic Surgery after serving 22½ years in that role. A truly outstanding surgeon, he has brought great honor and distinction to himself, our Surgical Service, and to St. Luke's Hospital. It is appropriate that Dr. Clayton R. DeHaan will succeed Dr. Stark. Dr. DeHaan was the first surgical resident in Dr. Stark's newly approved Plastic Surgical Training Program in 1958.

Continued progress in our Surgical Research Laboratories was primarily due to another most generous \$100,000 grant from the Clark Foundation. For the second consecutive year, scientific papers from our laboratories were presented at the annual meeting of the Society of University Surgeons by one of our residents, Dr. Warren B. Burrows. Our Eleventh Annual Postgraduate Course was again given in March 1978 and we were greatly honored to have Dr. J. Englebert Dunphy, Chairman and Professor of Surgery Emeritus at the University of California as our William F. MacFee Visiting Professor of Surgery.

We are grateful to all of our Attending Surgeons who give so willingly and cooperatively of their time

in maintaining the highest degree of excellence in patient care and teaching. Similarly, we are grateful to, and indeed, impressed by the thirty-two members of our Surgical House Staff. They are a highly motivated, industrious, hard-working group of men and women who add tremendous strength to our Surgical Service.

Twenty-four papers were published in various surgical journals by members of our staff who gave a total of 14 presentations at various national and local surgical meetings.

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Urology

JOHN K. LATTIMER

Professor and Chairman of the Department • Director of Service

The Urology Department continues to conduct one of the largest educational and research-oriented Urology Services in the world.

The Urology Service celebrated the 50th Anniversary of its founding as the Squier Urologic Clinic by Dr. J. Bentley Squier, by an extra out-pouring of new scientific and educational data. As of 1978, 96 graduates, staff members or former Urology residents have entered academic medicine in Urology. Fourteen have become Chairmen of Departments, 6 have been offered Chairs but declined them, and 46 are Associate or Full Professors.

Teaching

The undergraduate program, teaching small groups of students in two week rotations, continues to be especially well received by the students. This rotation gives practical urologic clinical experience to all students. Dr. Peter J. Puchner serves as Course Director for both the Clinical Clerkship and the one-month Urology Elective in which all Squier Clinic attendings participate. The elective continues to be utilized by the students from P&S and other institutions to further their knowledge of urology and to explore future career interests.

Attendings and residents from Presbyterian Hospital continue to participate in the urology portions of the first year Gross Anatomy Course in the Medical School and in the Correlation and Introduction to the Patient Courses.

Resident training at Overlook Hospital has become a major addition to the residency program.

During each four-month period, the two residents who are on rotation obtain an important surgical experience at this busy suburban institution. The Journal Club has continued to be a popular forum for discussion of current urological topics. Dr. John D. Birkhoff, who has been a prime mover in the formal structuring of resident training, has also recruited a number of experts in urology-related fields for the weekly Thursday evening sessions, which now have been recognized for Category I CME credit. Dr. Ralph J. Veenema continues to conduct the weekly Urology Tumor Conferences with the resident and attending staff and students. This multidisciplinary conference also involves Uropathology, Radiotherapy and Oncology representatives. He represented the Department of Urology in the meetings and Cancer Center grant preparations from the Columbia University Institute of Cancer Research. He also represented the Department in the development of the Cancer Center's Clinical Research Data Base information forms for the Registry and Epistat Computer Center, with Drs. Michael Wechsler and Nicholas Romas. Dr. Peter DeSanctis has initiated bi-weekly rounds at the Neurological Institute at which management problems of patients with neurogenic bladder are discussed. In addition, a bi-monthly neurogenic bladder out-patient clinic is in the process of formation. Weekly Grand Rounds, staff meetings and quality control meetings conducted by Dr. Lattimer, round out our program. The Meyer M. Melicow Residents Library continues to enlarge and provides a source of reading and audio-

visual material which receives almost continuous utilization from students, residents and attendings alike. The sudden death of Dr. Leslie Gulton, a founder and generous contributor to the M.M. Melicow Library, and a real friend of medical research, was deeply felt by the entire Department.

Dr. Melicow conducts postgraduate uropathology sessions on pheochromocytoma, preparing candidates for the Boards in Urology and also gives a series of lectures at Lenox Hill Hospital, covering pathology of the entire urinary tract and lectures to the Department of Urology staff on the history of urology and on a spectrum of malignant epithelial tumors of the prostate gland.

In December, Dr. Patrick Walsh from Johns Hopkins University Medical Center spent two days at the Squier Clinic as the third annual Lewis Weikert Visiting Professor, hosted by Dr. Myron S. Roberts. These extremely popular educational sessions have been attended by many alumni, and by attendings and residents from St. Luke's, Roosevelt, Harlem and Overlook Hospitals and the U.S. Public Health Service Staten Island Hospital, as well as the Medical Center. Formal lectures and informal discussions were held on a number of urological topics.

Dr. Terry W. Hensle, new Director of the Pediatric Urological Service, has enlarged that activity in volume as well as in range and versatility, in a number of ways. The clinical experience obtained by residents during the Pediatric Urology rotation is excellent and is expanding rapidly.

Dr. John K. Lattimer, President of the International Urological Association, presented a paper, "The Exstrophy Support Team—A New Concept in the Care of the Exstrophy Patient" at the American Urological Association's Annual Meeting in Washington, D.C. with co-authors Dr. Hensle, Michael T. Macfarlane, Dr. Leah Beck (Psychiatry), Esther Braun and Yvonne McGrath, at the same meeting, he also presented a paper entitled "Delayed Development of the Scrotum in Exstrophy" with Dr. Puchner and Mr. Macfarlane.

Dr. Birkhoff described "Medical Management of Benign Prostatic Hypertrophy: Results With Flutamide, Candicidin, Lergotril" at the Washington meeting with co-authors H.H. Zinsser and Veenema.

Dr. Myron Tannenbaum of the Uropathology Division, with Dr. Romas, taught at the five-day Post-Graduate Review Course in Urological Pathology designed to prepare urologists for Board Certification examinations in January. In March, he participated in the Symposium on Surgical Pathology of the GU Tract and delivered the special course on "Electron Microscopy in Diagnostic Pathology" at the In-

ternational Association of Pathologists meeting in Atlanta, Ga. He participated in the mini-uropathology course at the New York Section of the A.U.A. Post-Graduate Seminar in New York City, delivered a specialty course on the "Role of Cell Membranes in Human Disease" at the 12th Congress of the IAP in Jerusalem, Israel and presented the mini-uropathology course at the South Central Section of the AUA Post-Graduate Seminar in Denver, again with Dr. Romas.

Dr. Hensle participated in an American College of Surgeons Symposium at the St. Francis Hospital in Roslyn, New York on "Nutritional Support of the Critically Injured Patient" and discussed the "Impact of Surgery on the Starving Patient" before the American Society of Contemporary Medicine and Surgery. He addressed the Mississippi State Society of Urology and was Visiting Professor of Urology at the University of Mississippi Medical Center in Jackson, Mississippi. Dr. Hensle gave a talk on Nutritional Assessment for the American Society for Parenteral and Enteral Nutrition at the New York City Regional Meeting and presented the concept of the Exstrophy Support Team at the Society for Pediatric Urology in Washington. He attended the Children's Cancer Study Group in Montreal, Canada as part of the Wilms' Tumor Section and attended the International Reflux Symposium in Essen, Germany. Dr. Hensle spoke at the New Jersey College of Medicine on Nutritional Support of the Urologic Patient and presented an update of Exstrophy Survival data to the American Academy of Pediatrics in Chicago. Dr. Hensle served as a panelist on "Undiversion" at the New York Section of the AUA in Dublin, Ireland, describing his experience with this complicated procedure performed on 13 patients to date at the Babies Hospital, and lectured to the IUS Para-Urology Workshop on Undiversion.

Dr. Nicholas A. Romas described the "Immunological Detection of Prostatic Acid Phosphatase" at the New York Medical Society Meeting in New York. He demonstrated and described the greatly improved Immunochemical Assay for Human Prostatic Acid Phosphatase at the Seminar on Clinical Pathology of Cancer of the Endocrine Glands and Target Organs at the Association of Clinical Scientists meeting in Washington, and with Drs. Ino Janecka of the Plastic Surgery Department presented an exhibit on Transplantation of Testes by Microsurgery at the National meeting of AUA in Washington, D.C.

Dr. Frank Longo presented his research concerning "Urolithiasis in Pregnancy" at the meeting of the New York Section of the AUA in Dublin. Dr. Longo also continues as Director of the Charles Lachman

Ultrasound Cancer Research Laboratory. That team's latest research developments were presented at the Annual Meeting of the American Institute of Ultrasound in Medicine by Dr. Bernard D. Rivin. The untimely passing of Mr. Lachman, friend and philanthropist, is profoundly mourned by his colleagues. Dr. Tomashefsky continues to remain active in ultrasound research as well as in the study of the hypertrophic effect of tumor-bearing upon the spleen.

Dr. Myron Roberts is Secretary of the New York Section of the A. U. A. and continues to serve on the Advisory Committee of the Urology Section of the New York Academy of Medicine and was Program Chairman at the urological meeting in Ireland.

Dr. Peter N. DeSanctis was invited to judge at the Urological Resident Essay Contest of the Brooklyn-Long Island Urological Association meeting.

Dr. Melicow gave the Inaugural address of the annual M.M. Melicow Lectureship for Israel: Urology, sponsored by the Israel Urological Society of the Israel Medical Association, on "The Urothelium as an Oncogenic Battleground." He gave the introductory address for Dr. Moses Swick, who gave the 2nd John K. Lattimer Lecture at the A.U.A. annual meeting in Washington, D.C. He also won First Prize for his pen and ink sketch: "Eerie Night—Central Park, N.Y."; and Third Prize for an acrylic painting: "The Lantern," at the American Physicians Art Association at the AMA Convention in St. Louis, Missouri in June.

Dr. Aurelio Uson was appointed Professor & Chairman of Urology at the Medical School of Madrid.

Research

Dr. Veenema's studies continue with Dr. Bruno Fingerhut on an "Animal Model for Prostatic Carcinoma" with special emphasis on its hormonal responsiveness, its metastasis, and its transplantability.

The Squier Urology Research Laboratories, where Dr. Romas, with Drs. Tannenbaum, Hsu and Tomashefsky have now carried their research on prostatic acid phosphatase detection techniques beyond the laboratory stage so that this more specific and more sensitive test can now be used in the detection of clinical disease. Comparisons of the efficacy of counter-immune-electrophoresis vs. radioimmune assay techniques are now being made.

Dr. Birkhoff has collaborated with Dr. A. Franz (Medicine) on evaluation of prolactin dependence of prostatic carcinoma in animal models.

Dr. Tannenbaum undertook an extensive ultrastructural study with the scanning electron microscope and the transmission electron microscope

utilized on all parts of the GU system where there is urothelium (transitional epithelium). These studies were done in part with Dr. H. Carter of the St. Barnabas Medical Center. With this as a background, further collaborative work was undertaken with Dr. P. Troven of the Hoffman La Roche Co., on the effect of 13 cis-retinoic acid and trans-retinoic acid on neoplastic bladder cells.

Dr. Melicow continues his studies on oncogenesis: small celled tumors, mechanism of metastases and on metastases to prostate and testis.

Patient Care

Dr. Frank Longo continues as Director of Adult Urology Clinics and actively pursues the modernization of clinic facilities. An even more sophisticated urodynamic research and clinical facility has been approved and will replace outdated urodynamic equipment. When installed by the start of the new year, full micturitional studies will be possible, utilizing modern techniques. Michael Macfarlane provides engineering background and participation in this work.

Dr. David Follett (Radiology) and the Squier Uro-Radiology Division of the Department of Urology continue to provide superior services.

Mrs. Yvonne McGrath offers expert consultation and support in stomal care and rehabilitation.

In June, an era ended with the retirement of Mrs. Margaret Reilly, Head Nurse in Cystoscopy. Mrs. Reilly served the Medical Center for 42 years and watched over the interest of the Urology Service, its attendings and residents in a manner that is rarely seen. At her farewell party, staff, alumni, friends and admirers joined in thanking her for services far above the call of duty.

The Department welcomed back on its staff Ms. Esther Seabron who had been with the Department for 12 years at the Delafield Hospital Unit. Ms. Seabron returns to work as coordinator of Clinical Research and in the Data Base Center for Urological Neoplasms.

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Weber, Mrs. Samuel Webster, Dr. Michael Wechsler, Zelda Radow Weintraub Cancer Fund, Inc., Dr. Robert Weiss, Mrs. Mitchell Preston Wells, Mr. and Mrs. Charles J. Wicks, Mr. William E. Wiegand, Dr. Mark W. Welch, Mrs. Dorothy Yates, Harold Zuckerman (Zuckerman Contractors, Inc.).

The Department mourns the passing of Mr. Michael Chernow during the past year. Mr. Chernow, with his family and many friends from Monet and General Mills, was a long standing, vigorous supporter of the Department's research and educational program. His dedication to research and stimulating participation in our overall departmental program will be greatly missed.

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International Institute for the Study of Human Reproduction

RAYMOND L. VANDE WIELE

Director

The International Institute for the Study of Human Reproduction consists of two Centers: A Center for Reproductive Sciences, directed by Dr. Georgiana Jagiello and a Center for Population and Family Health, directed by Dr. Allan Rosenfield. The Center for Reproductive Sciences incorporates an interdisciplinary group of investigators in the College of Physicians and Surgeons devoting themselves to the study of the biochemical and physiological aspects of reproductive function. A detailed report of their activities is included in the report of the Department of Obstetrics and Gynecology.

Since its organization in 1975, the Center for Population and Family Health has assembled a multinational, multidisciplinary staff with expertise in medical, international public health, and social science aspects of population problems and in the design, execution, and evaluation of the delivery of low-cost family planning and other basic health services to the vast rural village and burgeoning suburban slum populations of the developing world and, to the extent that similar needs exist, to the socially disadvantaged inner city populations of New York and the major metropolises of the economically "developed" countries.

The activities of the Center for Population and Family Health of the International Institute for the Study of Human Reproduction and the Division of Population and Family Health of the School of Public Health overlap to a considerable extent. International activities are emphasized in the present section while teaching, reproductive health services, and adolescent social research are emphasized in the report of

the School of Public Health. Both should be read for a representative picture of the full range of activities. The programs of the Center have evolved in four partially interrelated sectors.

International Research and Technical Assistance

Although it is moderating in some places, excessively rapid population growth continues to threaten socioeconomic development efforts in Africa, Asia, and Latin America. Despite scientific and technologic advances and the development of national family planning programs, lack of knowledge and access to basic health, fertility control, and related social services, remain a reality for millions of people, particularly in the most needy countries. Technical expertise is also very limited in such poor countries. With support primarily from USAID, the Center responds to requests from governments and private associations in developing nations for technical assistance in the organization, implementation, and evaluation of new and improved approaches to family planning and related health services. Recent activities have been conducted in 11 countries, with a concentration in Latin America.

Brazil: Drs. John Ross and Martin Gorosh assisted the private family planning association BEMFAM, the principal service delivery agency in Brazil in the absence of governmental services, in designing a state level social marketing experiment and an integrated contraceptive distribution—parasite control program, and in evaluating the expansion of community based distribution programs. They also con-

sulted with CPAIMC, a maternal and child health agency, on the evaluation of an integrated maternal and child health and family planning program involving a hospital based postpartum family planning service and outreach program.

Colombia: Dr. Tegulada Monreal consulted with several Columbian agencies on the methodology for assessing the incidence of abortion and on a new program for the management of incomplete abortion, a major public health problem throughout Latin America.

Guatemala: Mr. Stephen Isaacs and Ms. Margaret McEvoy continued their technical assistance to AP-ROFAM, the private family planning association, in general programming and in evaluation of two Center financed experiments in contraceptive distribution to agricultural workers and their families.

Haiti: Dr. Robert Hanenberg, resident in Haiti, and Ms. Joanne Revson assisted the Ministry of Health in designing, implementing, and evaluating a pilot program of household distribution of contraceptives and simple medicaments by specially trained local residents in 18 Haitian villages.

Mexico: Dr. Henry Elkins, Mr. Stephen Isaacs, Dr. Walter Torres, Ms. Michelle Shedlin, and Mr. Jairo Rios rendered technical assistance, principally in program design and evaluation and training to the Autonomous University of the State of Mexico, to the National Family Planning Coordinating Council, and the General Directorate for Maternal and Child Health and Family Planning.

Peru: Dr. Krishna Roy, Mr. Stephen Isaacs, Dr. Walter Torres, and Dr. William Van Wie consulted with and assisted personnel from INPRMI (the Institute of Neonatology and Maternal and Infant Protection) and two of the country's health regions in the development and evaluation of an integrated health-nutrition-family planning project involving delivery of the basic services in the Mid-South Health Region by 1700 local village agents. This is a major breakthrough in a country which has, until very recently, been hostile to family planning.

Bangladesh: Dr. Elkins continued his technical assistance to the Bangladesh Social Marketing Service and the Dacca University Institute of Statistics and Research Training on the assessment of a social marketing experiment and a feasibility study of a mixed program of household contraceptive distribution with commercial resupply through retail outlets and specially trained traditional medical practitioners. Drs. Allan Rosenfield and William Van Wie consulted with Dr. M.A. Saltar, Secretary of Population Control and Family Planning in the Ministry of Health and Population Control, on the development of an integrated districtwide (population of 5 million)

family planning and maternal and child health services which could serve as a model for the national program. At year end, Dr. Christina Brinkley-Carter and Ms. Revson were in Bangladesh consulting on a Concerned Women project financed by Family Planning International Assistance involving contraceptive distribution by women to women in that strongly male dominant society.

Korea: Mr. James Foreit took up residence in Korea as multifaceted applied research advisor to the Korean Institute for Family Planning.

Thailand: Mr. Anthony Bennett continued his residence and multifaceted research advisory assistance in Thailand where he works with the Research and Evaluation Unit of the National Family Planning Program. He also assists the Mahidol University School of Public Health and the Community Based Family Planning Service in evaluation of their family planning activities.

Nigeria: In both Ibadan and New York, Ms. Revson and Drs. Nicholas Cunningham and Walter Watson assisted personnel from the Department of Obstetrics and Gynecology of the University of Ibadan in the development of an integrated village-based family planning and maternal and child health demonstration project, with various services delivered by traditional birth attendants, other specially trained community agents, and government midwives. This community-based delivery project, which is expected to commence in early 1979, will be the first of its type in Subsaharan Africa.

Sudan: In Khartoum and New York, Drs. Gorosh and Watson assisted personnel from the Department of Community Medicine of the University of Khartoum and the Ministry of Social Affairs in the development of an integrated community-based distribution demonstration project, generally similar to the Nigerian one.

Community-Oriented Reproductive Health Services for Women

The Center has accepted the responsibility for the community-oriented reproductive health services for women of the Department of Obstetrics and Gynecology. Beginning activities in this field are described in the report of the Department of Obstetrics and Gynecology.

Adolescent Social Research

Complementing the Center's research, technical assistance, and service activities in developing countries and in New York City is an expanding program of basic and applied social research on teen-age sexuality, venereal disease, contraceptive use, preg-

nancy, abortion, and parenting. The research derives in part from problems encountered in the Center's other programs, and, in turn, feeds back into these. Drs. Christina Brinkley-Carter, Susan Philliber, Pearla Rothenberg, and Ms. Katherine Darabi are the primary participants in these studies which are described in greater detail in the report of the School of Public Health.

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Institute of Human Nutrition

MYRON WINICK

Director

Teaching

The Institute of Human Nutrition is entering its seventh year under the directorship of Dr. Myron Winick. During this time 115 students have completed the Master of Science program; nine have earned the Doctor of Philosophy degree, and six Master's graduates have continued for the Doctor of Public Health degree. A total of 26 postdoctoral fellows have participated in the program. Of the 57 Master's graduates applying to medical or dental schools, 55 have been accepted; 19 have entered the Institute's doctoral program; six are in doctoral programs elsewhere, and the remainder of the Master's graduates are in positions related to nutrition and health.

In autumn this year 15 were accepted into the Master of Science program; five new students were accepted into the doctoral program, making a total of 24 candidates for the Doctor of Philosophy degree, 19 of whom are graduates of the Master's program. Twenty M.S. degrees have been granted since January 1978. Four doctoral candidates are scheduled to receive their degrees in January of May. Currently, there are seven postdoctoral fellows in the program.

This year is marked by considerable expansion in the teaching program of the Institute. Dr. F. Xavier Pi-Sunyer is directing a new course in clinical nutrition in the Master's curriculum. A course in medical statistics, designed especially for Institute students, will be added in the spring term. A two-term course in perinatal nutrition, particularly for nurses, has been established and is team taught by Dr. Pedro Rosso,

Barbara Luke, and Catherine Muttart. A new course in nutrition for dental hygienists is given by Drs. Brian Morgan and Jaime Rozovski. Through the Continuation Education program Dr. Morgan taught a course in general nutrition at the Mamaroneck High School, and next term he will teach a course on nutrition and disease for paramedical workers at the Morningside Campus. Several doctoral students are teaching nutrition courses in undergraduate schools in New York City. The newly required course in human nutrition for medical students was taught during the fall term by Dr. Myron Winick. It will be repeated in the spring to the first year classes of both the medical and dental schools. The Mini-Symposia, a series of six presentations by advanced students and postdoctoral fellows and directed by Dr. Robert S. Bernstein, has become an integral part of the Institute's annual training program. Last year the Institute provided clerkships for two awardees of the AMA Goldberger Scholarship in Clinical Nutrition. Twenty medical students from the College of Physicians and Surgeons and other medical schools came to the Division of Metabolism and Nutrition and of Endocrinology in St. Luke's Hospital Center. Dr. Giorgio Solimano joined the staff of the Center for Population and Family Health and will promote the integration of training and research activities of the Center and the Institute of Human Nutrition.

Clinical Activities

The Divisions of Metabolism and Nutrition and of Endocrinology at St. Luke's Hospital Center con-

tinues the operation of the Hospital's 5-bed Metabolic Unit along with providing daily consultative services throughout the Hospital Center for patients with nutritional, metabolic or endocrinologic problems, and assuming responsibility for ambulatory care of patients in the Endocrine-Metabolic Clinic. Special clinical programs for the study and management of lipid transport disorders and for behavioral and other modalities of treatment of obese patients were emphasized. In addition, a new program for weight reduction was initiated where research data on psychological, behavioral and endocrine functions as well as food intake patterns were collected.

Research

Adipose tissue development in early life and during pregnancy remains the major focus of Dr. Jo Anne Brasel's research. Dr. Winick and others have continued research on the effects of malnutrition and environmental enrichment on brain gangliosides, on brain RNA metabolism and on behavior. Dr. Pedro Rosso's major research interest remains the maternal-fetal exchange of nutrients; the relationship of placental growth and placental blood flow to fetal growth in normal and undernourished mothers has been investigated this past year.

Dr. DeWitt S. Goodman and his colleagues in the Division of Metabolism and Nutrition have continued to conduct major research activities in the fields of lipid metabolism, arteriosclerosis, and the fat-soluble vitamins A and D. During 1978 active progress was made in projects dealing with cholesterol turnover and metabolism in man; lipoprotein and apolipoprotein metabolism in man; platelet-derived growth factor and growth regulation of human arterial smooth muscle cells; the metabolism and transport of vitamin A; and the transport of vitamin D and 25-hydroxyvitamin D in human plasma.

Studies by Dr. Richard S. Rivlin and colleagues show that phenothiazine derivatives and tricyclic antidepressants markedly antagonize the conversion of riboflavin into its active coenzyme derivative, flavin adenine dinucleotide, in various organs of the rat. Another study indicates that boric acid intoxication in man results in massive loss of riboflavin in the urine. Also, thyroid hormones in low doses were shown to enhance the formation of flavins bound covalently to tissue proteins; this effect was demonstrable in cerebrum and liver from adult animals. The effects of alcohol upon the intestinal binding and absorption of zinc was also investigated. Studies are continuing on the abnormalities of taste and smell demonstrable in patients with hypothyroidism as well as studies on the relationship of these abnormalities of disturbances in zinc metabolism both in patients and in an appropriate

animal model. Investigations are in progress in collaboration with Irwin Mandel and Robert Stuchell (dental medicine) to determine the effects of altered thyroid function in patients upon salivary flow and composition. Investigators working with Dr. Rivlin are Yee Ping Haung, Robert McConnell, Martha Osnos, and John Pinto.

The Institute collaborates with the Surgical Metabolism Program, under the direction of Drs. John M. Kinney and David H. Elwyn, where research in progress is related to gas exchange, ventilation, parenteral nutrition, energy metabolism and tissue fuels. Active studies are underway concerned with a) calorie/nitrogen balance in depleted surgical patients receiving total parenteral nutrition, b) effects of glucose loading on glucose kinetics in traumatized patients, c) lipid metabolism in injury and infection, which may shed light on how fat is mobilized during injury and infection and, ultimately, how total parenteral nutrition can be expected to modify endogenous fat mobilization, d) muscle amino acid patterns in trauma.

Numerous investigations by the Institute's staff at St. Luke's Hospital Center are in progress. Dr. Sami A. Hashim and colleagues continue studies of medium-chain triglycerides in man and experimental animals. Dr. F. Xavier Pi-Sunyer and others have conducted studies on the long-term functional integrity of intraperitoneal islet-transplanted rat pancreatic islets and of tissue culture preservation and intramuscular transplantation of both rat and human islets. Other studies include the effect of age and fasting on the response of circulating carbohydrate and lipid metabolites of rats whose adipose tissue has been enriched with odd-carbon fatty acids; the effects of cholecystokinin in human volunteers; and the relationship between lipogenesis and glucose utilization in rat adipocytes. Dr. Robert S. Bernstein is studying control of adipose tissue substrate utilization in states of insulin resistance induced by diet and in cultured adipose tissue. In addition, he is working with a stimulatory effect of human serum on insulin responsiveness of cultured tissue. Dr. Theodore B. Van Itallie and others are studying in the human the effects of protein-modified fasting vs. isocaloric carbohydrate-protein mixed diet on metabolic balance and composition of weight loss. A project is in progress on the food intake behavior of *do*/*ob* mice and their lean siblings. Investigations are continuing on the defense of body weight in human obesity, and a study of dietary obesity vs. genetic obesity on body composition and fat cell morphology has been completed. Dr. Harry Kissileff with Dr. Van Itallie has studied the effect of food consistency on eating in human volunteers, using an eating monitor.

Honors

Dr. Winick was the AMA Joseph Goldberger Visiting Professor in Clinical Nutrition at the University of Minnesota; also, he was appointed Scientific Chairman of the National Maternal and Infant Malnutrition Conference sponsored by the President's Commission on Retardation and the National Foundation/March of Dimes in March. Dr. JoAnne Brasel was elected president of the Society for Pediatric Research and to membership on the American Institute of Nutrition Nominating Committee. She also serves as the Endocrine Society representative to the Council of Academic Societies of the Association of American Medical Colleges. Dr. Pedro Rosso was selected to chair a scientific session of the XIth International Congress on Nutrition in Rio de Janeiro and was an invited speaker at the Conference for UNICEF leaders at the Harvard School of Public Health. He also was appointed to the Nutrition Study Section of the National Institutes of Health to a four year term to begin in 1979. Drs. Brasel and Winick both made presentations at the Special Symposium on Semi-Starvation sponsored by the Institute of Human Nutrition as well as participating in the Pediatric Postgraduate Course sponsored by Babies Hospital. Drs. Brasel, Winick and Rosso all presented symposia at the Annual Academy of Pediatrics Meeting. Theodore B. Van Itallie was designated as Editor-in-chief of the *American Journal of Clinical Nutrition* and was made a member of the National Arthritis, Metabolism, and Digestive Diseases Advisory Council.

Dr. Giorgio Solimano was chairman of the Conference on International Assistance for Maternal and Infant Nutrition in Developing Countries for the Committee on International Nutrition Programs, Food and Nutrition Board, National Research Council.

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Hakim, P. and Solimano, G.

Other Activities

The Symposium on Semi-Starvation was presented in the Alumni Auditorium on May 24 in honor of physicians of the Warsaw Ghetto and their pioneering investigations on hunger. *Hunger Disease*, their manuscript on the Warsaw Ghetto, has been translated by Martha Osnos and edited by Dr. Winick and is soon to be published by John Wiley & Sons, Inc.

The Seventh Annual Symposium on Nutrition was conducted on November 30 and December 1 in New York City with over 700 physicians and health specialists in attendance. Papers were presented by sixteen scientists. Their presentations will be published as Volume VIII, *Current Concepts in Nutrition: Nutrition and Gastroenterology*, Myron Winick, editor and John Wiley & Sons, Inc., publisher.

A bi-monthly newsletter, *Nutrition and Health*, is being published by the Institute under the auspices of the Health Science Division of Public Education. It is prepared by the Institute faculty and edited by Dr. Winick. The aim of the publication is to provide the public at large valid information concerning important aspects of nutrition as it relates to good health.

Donors

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Cancer Center/Institute of Cancer Research

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JAMES A. WOLFF

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During the past year, two major appointments have added to the Center's capabilities. Dr. Rose Ruth Ellison, formerly Professor of Medical Oncology at the State University of New York at Buffalo, was appointed Deputy Director for Clinical Research and Patient Care in the Center, as well as Chief of the Division of Medical Oncology in the Department of Medicine. Dr. Ellison has begun a major recruitment effort to the faculty in clinical cancer research. Dr. James Wolff has been appointed Deputy Director for Cancer Control. His new activities are focused on

developing programs in community-wide prevention, treatment, rehabilitation, epidemiology and cancer education. Both of these appointments greatly strengthen the Center's broad interdisciplinary programs in basic and clinical cancer research.

A computerized Tumor Registry/Research Data Base was started at the Cancer Center in a collaborative effort with the Presbyterian Hospital. All patients with cancer are now being registered and the system is designed to improve patient care, teaching and research.

Administration

The Administrative Division of the Center continues to provide administrative services including grants and contracts management, personnel, and the management of central facilities for glassware preparation, tissue collection, animal care, computer operations, electron microscopy and other cytological facilities.

The Epidemiology-Biostatistics Unit headed by Dr. Mary Curnen provided assistance to investigators in the planning and conduct of clinical research projects. The computerized clinical data base is managed in this unit. The computer-based clinical data display system, MEDGRAF, designed by Drs. Elliott Osserman and William Sherman, provides an instantaneous linear clinical data profile for selected patients for the use of physicians in both ambulatory and in-patient facilities and includes a growing number of patients with a variety of neoplastic diseases including myeloma, breast cancer and others.

The Center operates two tumor tissue facilities, under the direction of Dr. Cecilia Fenoglio (Pathology) and Dr. Philip Duffy (Neuropathology). These facilities maintain an efficient system for the collection, processing and distribution of tissues.

Clinical Research and Patient Care

This scientific section, under the direction of Dr. Rose Ruth Ellison, is developing an integrated program of clinical research and patient care. Organ Site Committees are charged with responsibility for developing guidelines for diagnostic and staging procedures and for designing research protocols. The clinical faculty was augmented by the recruitment of Dr. Esteban Cuitkovic.

A major thrust has been in the area of lymphoproliferative tumors. Studies have been undertaken by Drs. Daniel Knowles and James Halper for the phenotypic characterization of malignant lymphoid cells. Their studies are based, in part, on the recognition that standard histopathological classifications of lymphomas do not take into consideration the immunologic heterogeneity of human lymphoid cells. Dr. Richard Edelson has studied the cutaneous T cell lymphomas. While some of these patients had classical mycosis fungoides and Sezary syndrome, others have disorders previously classified as reticulum cell sarcoma or well-differentiated lymphocytic lymphoma involving the skin. Investigations being conducted by Dr. Edelson, Dr. Carole Berger and their associates include study of the biological properties of neoplastic cells and the search for tumor specific antigens. They are also studying the potential antineoplastic activity of photochemotherapy using psoralen and Ultraviolet A. Dr. William Sherman

has participated in an investigation of the T cell lymphomas designed to characterize clinical patterns and to correlate these with the laboratory identification of cell populations as well as with the classical morphologic categorization of these diseases. Dr. Leonard Chess has isolated several allo- and hetero-antisera which react with various subpopulations of normal and leukemic cells. They are being used for study of T cell differentiation in T and "null" cell lymphomas. Dr. Benvenuto Pernis is currently studying plasma cell dyscrasias in conjunction with Drs. Osserman and Halper, investigating the characteristics of cells which have the potential for differentiation. Dr. Dorothy Warburton is determining the karyotype of patients with different lymphomas. There has been no prior systematic look at karyotypes in these diseases and, particularly, no correlation of karyotype analysis with surface membrane characterization. Dr. Nicole Suci-Foca is studying the HLA types in families of patients with lymphomas and other lympho-proliferative diseases. Dr. Robert Ellsworth and his associates in the Eye Tumor group have studied the D-locus on chromosome 6 and found that patients with spontaneous regression of retinoblastomas had activity at the DW-2 locus and no activity at the DW-1 locus while patients whose tumor did not regress despite apparently adequate treatment had reversed activity at the DW-1 and DW-2 loci. Orbital rhabdomyosarcomas are also being investigated; over the past ten years, 70 patients have been treated with a combination of radiotherapy and chemotherapy, as opposed to exenteration; the survival rate in this group is 71%. Dr. Cheng-Chuen Huang, with Dr. Max Abramson, is measuring and characterizing a collagenolytic enzyme from a variety of head and neck tumors, to determine the significance of collagenolysis in the invasiveness and clinical behavior of these malignancies. Dr. Ronald Brisman has continued his studies on brain tumors in experimental animals. A model (intracerebral inoculation) of Schmidt-Ruppin strain of Rous sarcoma Virus) has been developed and a large brain tumor can be developed. The tumor can be detected by radionuclide scanning and computerized tomography, and the effects of medication on the tumor are being studied. Dr. Paul LoGerfo has examined the value of serum thyroglobulin levels in the work-up of patients with benign and malignant thyroid disease. Preliminary results show that levels are elevated in patients with non-metastatic thyroid carcinoma. This study may demonstrate the feasibility of using serum TG levels to detect early thyroid cancer. Dr. Chu H. Chang, with Dr. Sadek K. Hilal, has developed a new clinical staging system for supratentorial malignant glioma. They found that the size of the primary

tumor and the associated changes such as peripheral edema, contrast enhancement and midline shift as recorded by CT scan correlate more accurately with the prognosis than other previously reported criteria. Drs. Leonidas Harisiadis, Paul Sung, and Chu Chang have established the radiosensitivity and radiocurability of suprasellar germinoma and pineal tumor. Dr. Chang is the chairman of the malignant glioma study of the Radiotherapy Oncology Group and a member of the medulloblastoma study of the Children's Cancer Study Group. To date, over 400 patients have been included in the malignant glioma protocol and over 110 patients in the medulloblastoma protocol. No significant improvement in survival of the combined radiotherapy and chemotherapy arm over the standard radiotherapy arm has been observed. Dr. Sadek Hilal and colleagues have developed a stationary detector array computed tomography total body scanner (fourth generation scanner) which is now being evaluated for non-invasive early diagnosis and characterization of neoplasms. The instrument has a uniquely high resolution with high image quality, exceptionally free of artifacts; it proves to be particularly valuable for early non-invasive detection and characterization of tumors of the orbit, spinal cord, and retroperitoneal spaces. Dr. Ralph Veenema is directing an interdisciplinary study of genitourinary tumors encompassing urological surgery, radiotherapy, pathology and medical oncology. In recent study, 159 patients who were candidates for radical retropubic prostatectomy for stage A or B prostatic cancer (good risk patients) were studied for survival and other parameters. The value of bone marrow acid phosphatase in the evaluation and staging of prostatic cancer has been examined in over 30 patients. The value of counter-immunoelectrophoresis for assay of prostatic acid phosphatase in bone marrow and serum has also been explored. Dr. Daniel Linkie has conducted a program of research designed to exploit hormone-tumor interactions and receptor biology in an effort to improve and extend both diagnostic and therapeutic modalities. Efforts have been directed at the characterization of the receptor systems for the sex steroids to provide insight into the mechanism of hormone-tumor interactions.

Chemical Carcinogenesis

Dr. I. Bernard Weinstein and his associates have continued their studies on the molecular and cellular events in chemical carcinogenesis. Together with Dr. Alan Jeffrey and Professor Koji Nakanishi, the complete chemical structures of DNA and RNA adducts formed in human, bovine and rodent tissues exposed to the ubiquitous environmental carcinogen

benzo (a) pyrene, have been elucidated. Collaborative studies have elucidated conformational and functional alterations in nucleic acids modified by the carcinogens N-2-acetylaminofluorene (AAF) or benzo (a) pyrene. Detailed studies have also been completed on the effects of DNA modification by AAF and benzo (a) pyrene on the structure and transcription of chromatin.

Dr. Dezider Grunberger and his associates have continued investigations on the relation of the conformational changes and repair of DNA molecules modified by chemical carcinogens. They have elucidated two types of conformational changes in DNA modified by N-2-acetylaminofluorene (AAF), and benzo (a) pyrene, 7,8 diol 9,10-oxide derivatives (BPDEO).

The laboratory of Dr. Alvin I. Krasna has been studying the mechanisms by which helix destabilizing protein lead to the separation of the complementary strands of DNA. This laboratory has also been active in seeking to develop new forms of non-polluting energy in order to decrease the incidence of environmental carcinogenesis.

Dr. Leonard Harber and colleagues have tested chlorpromazine and protriptyline, two photosensitizers used as psychotherapeutic drugs, in a red blood cell photohemolysis system. Both compounds photosensitized the lysis of red cells in presence and absence of oxygen. In contrast, all other membrane damaging photosensitizers require oxygen to photohemolyse red cells. These results indicate that chlorpromazine and protriptyline represent a new class of phototoxic compounds. In the laboratory of Dr. A.D. Andrews mutations in at least seven genes affecting the repair of ultraviolet-induced DNA damage have been identified among patients with xeroderma pigmentosum.

Viral Oncology

Dr. Sol Spiegelman and his associates are continuing efforts at developing a systemic monitoring and diagnostic procedure for human and experimental mammary tumors. They have demonstrated that blood levels of a glycoprotein (gp52) of the murine mammary tumor virus can detect the presence of primary as well as metastatic mammary tumors. Serial assays of gp52 can anticipate the onset of post-surgical relapse. Early response of gp52 provides a prognostic indicator for therapeutic outcome.

Dr. Hamish Young, in collaboration with Dr. Harold Ginsberg, is studying the mechanisms of genetic recombination in a simple animal virus system, using temperature-sensitive mutants of adenoviruses of two distinct serotypes, Ad2 and Ad5. It has been found that recombination is a continuous process,

occurring throughout the infectious cycle, and that DNA from recombinant viruses harvested late in infection display a higher frequency of physical exchange than those from early stages.

The long-range research goal of Drs. Donald Mills and Fred Kramer is the modification of nucleic acids so that they may be used as agents in the cure and prevention of genetic or viral disease. Efforts have been concentrated on understanding the mechanisms of nucleic acid replication and on the development of techniques for the modification of the structure and function of nucleic acids. Artificially-prepared heteroduplexes have been used in a study of base mismatch correction in animal cells.

The laboratory of Dr. Ramareddy Guntaka has examined the biochemical events taking place in avian sarcoma virus-infected cells, including the mechanism of virus packaging and maturation.

The laboratory of Dr. Saul J. Silverstein has studied the regulation and expression of herpes simplex virus (HSV) genetic information. He has examined the mechanism used by animal viruses to redirect the cell protein synthetic apparatus towards synthesis of virus-specified polypeptides and the arrangement and expression of herpes simplex virus genetic information in the chromosomes of transformed cells.

Cancer Immunology

Dr. Elliott F. Osserman and his associates continued coordinated clinical and immunochemical investigations of multiple myeloma, amyloidosis and related neoplastic plasma cell dyscrasias, providing evidence that the monoclonal immunoglobulins are functional antibodies.

Dr. Benvenuto Pernis and associates developed their research program along four different lines: 1) study of the differentiation of human lymphoblastoid cells *in vitro*; 2) study of idiotype regulation in mouse lymphoid cells; 3) focusing of polyclonal B cell activators; and 4) studies of membrane immunoglobulins on peripheral blood lymphocytes of patients with myeloma. Dr. Leonard Chess and associates have investigated the specificity of cytotoxic-T-lymphocytes, and evidence has emerged that they recognize not hapten but either hapten-induced alterations of cell surface determinants or hapten in conjunction with unmodified cell surface determinants.

Dr. Arthur Bloom has continued work on the human lymphocyte culture system for testing the effects of known or putative chemical mutagens on specific genetic loci. They have demonstrated a dose-response curve for an alkylating agent and a frameshift mutagen, at the locus specifying the syn-

thesis of hypoxanthine-guanine phosphoribosyl transferase (HGPRT).

Dr. Elvin Kabat has carried out research designed to elucidate the structural basis of antibody complementarity, the specificities and sizes of the combining sites of various lectins, and determination of the structures of blood group A, B, H, Le^a, I and i substances. A second edition of the data bank of sequences of the variable regions of immunoglobulin chains is in preparation. These studies have led to a better understanding of the nature of antibody specificity as it relates to the three-dimensional structure of antibody combining sites. In collaboration with Drs. Reuben Lotan and Nathan Sharon of the Weizmann Institute, Israel, Dr. Kabat has studied the combining site of the lectin from the peanut (*Arachis hypogaea*). It was most specific for *D*Galod→3*D*GalNAc and reacted best with the antifreeze glycoprotein present in Antarctic fishes which is built up of oligosaccharide side chains with this structure. He is also studying the combining site of the lectin from rabbit liver which binds asialoglycoproteins and has purified and characterized the combining site of the lectin from *Maclura aurantiaca*. The combining sites of two myeloma proteins from NZB mice which have anti-dextran specificity have been studied; these have groove-type combining sites specific for internal chains of α D→6 linked *D* glucosyl residues.

Dr. Bernard F. Erlanger and his colleagues continued experiments on the use of nucleic acid sequence specific antibodies in elucidating the structure of eukaryote chromosomes and viral nucleic acid configuration and structure of nucleic acid-protein interactions. Major collaborative efforts with Dr. Guntaka and Dr. Miller are directed at the cytological use of nucleic acid antibodies.

Cellular and Molecular Genetics

Dr. Orlando J. Miller and associates, using cytogenetic techniques, have discovered a gene on the X chromosome that is essential for normal male development. A mutation of this gene appears to be an important cause of one type of gonadal cancer, gonadoblastoma. With Drs. Dorothy A. Miller and Ramana Tantravahi, in collaboration with Dr. Carlo Croce (Wistar Institute), using a human fibrosarcoma cell line, HT1080, he has demonstrated that the species-specific suppression of the transcription (or processing) of ribosomal RNA (rRNA) is determined by the relative numbers of chromosomes of the two species retained by the hybrid cells.

Dr. Richard Axel and associates have used a variety of biological and chemical probes to examine the structure of chromatin, the distribution of protein

along genomic DNA, and the possible role of these structures in regulating gene expression in normal and transformed cells. The experimental approach chosen involves dissection of the chromosome with deoxyribonucleases and subsequent analysis of the nucleoprotein products. They have developed an approach for the isolation of specific genes involving transfection of restriction endonuclease treated DNA fragments under appropriate selection conditions into mutant cells.

Dr. Robert S. Krooth and his associates are conducting a study of the effect of imbalance in chromosome number on gene expression. They have evidence suggesting that fibroblasts which are trisomic for chromosome 2 express a locus which is normally unexpressed in diploid fibroblasts (or in fibroblasts trisomic for an autosome other than two). The product of this locus is normally found in brain, muscle and the erythrocyte membrane. These findings provide support for the idea that the ectopic synthesis of hormones, and other inappropriate products, by human cancers may result from the chromosomal heteroploidy of the cancers.

Dr. David Figurski studied the broad host range R-plasmid RK2 to identify the genes required for replication in *E. coli* and other hosts. A variety of physical and genetic studies were made to determine the function of these genes with respect to transacting function, cis-acting functions, host range, copy number regulation, incompatibility, and dominance over ColE1.

Cellular Development

The laboratory of Dr. Dean L. Engelhardt has studied cell growth using cultured animal cells and demonstrated 1) that epithelial cells require serum growth factors for growth, 2) that as they reach a high density they deplete these factors from the medium, and 3) that cells grown in depleted medium become trapped in the late S and G₂ phase of the cell division cycle.

The laboratory of Dr. Christine Milcarek is developing an understanding of the transcriptional and post-transcriptional regulation of gene expression in eukaryotic cells. Experiments were conducted to determine the proximity of the histone genes to RNA polymerase promoters and to elucidate the regulation of gene action through mRNA processing.

Dr. Arthur Bank, with Drs. Francesco Ramirez and Gregory Mears, has continued studies of the molecular defects in the thalassemia syndromes as an example of hereditary perturbation of a normal developmental program. A new method for the purification of α and β globin messenger RNAs has been described and used to confirm the defect in β globin

mRNA in the β thalassemias. The structure of normal and abnormal globin-region genomic DNA has been studied by the use of restriction endonuclease mapping techniques.

Drs. Paul Marks, Richard Rifkind, and Roberta Reuben have demonstrated that there is a predictable sequence of expression of erythroid characteristics during induction of differentiation of murine erythroleukemia cells (MELC), involving early and late markers. Previous evidence indicated that inducer must be present during at least one round of DNA synthesis prior to expression of their erythroid characteristics. Further evidence supports this conclusion and demonstrates that the initial accumulation of globin mRNA occurs during a transiently prolonged G₁ period of the cell cycle. It appears that alterations in chromatin may play a role in the induced expression of erythroid characteristics. On the basis of studies of the pattern of expression of erythroid characteristics in variant cell lines and wild type MELC induced with different agents, there is evidence that the expression of several erythroid characteristics are not coordinated in a causally related sequence.

Dr. Sherie L. Morrison has directed her research at isolating and characterizing mouse myeloma cell lines mutant for their production of immunoglobulin. These mutants enable investigation of 1) the organization and regulation of genes within the Ig locus, 2) the requirements, both structural and cellular, for assembly, glycosylation, and secretion of Ig, 3) the genesis of certain disease states, 4) the structural requirements for antigen binding, and 5) the rates and mechanisms of the generation of variation in constant, variable, and hypervariable portions of the IG molecule.

Radiation Biology

Dr. Harald Rossi and colleagues further refined the Theory of Dual Radiation Action, which accounts for the variation of biological effects such as cell killing and carcinogenesis as a function of radiation dose and quality. Dr. Eric J. Hall made comparative biological experiments at several high energy neutron facilities used for cancer therapy in the United States, Scotland and the Netherlands. Research in negative pi mesons was conducted at the Los Alamos Scientific Laboratory, and laboratory tests were continued with new drugs that sensitize tumor cells to the effect of x-rays. In experiments by Dr. Carmia Borek, fresh explants of hamster embryo cells were irradiated with x-rays and the frequency with which transformed malignant clones were produced was compared with that obtained when em-

bryos were irradiated in utero or in various processes of disassociation and subsequently assayed in culture. Dr. Richard Miller used established cell lines to study carcinogenesis *in vitro* and found that splitting a dose of x-rays into two equal fractions separated by 5 hours enhanced the frequency of cell transformations at low dose levels, but lead to a sparing effect at high doses.

Honors and Activities

Dr. Richard Axel was named recipient of the Young Scientist Award, 1978, by the Passano Foundation, Baltimore, Maryland. Dr. Carmia Borek served on the Pathology B Study Section of the National Institutes of Health. Dr. Mary Curnen gave a research paper at the XII International Cancer Congress, Buenos Aires. She was elected a member of the N.Y. Academy of Sciences. Dr. Duffy was Chairman of a section on neoplasia at the VIIIth Int. Congress of Neuropathology.

Dr. Edelson was visiting professor at Yale University and gave an invited lecture at the American Academy of Dermatology. Dr. Ellison continues as Vice President for Medical Scientific Affairs, Leukemia Society of America, Inc. She is also a member of the Board of Directors of the American Association for Cancer Research and a member of the Board of Scientific Advisors of the Division of Cancer Treatment, National Cancer Institute. She has just joined the Editorial Consultants of the *American Journal of Medicine*. Dr. Erlanger was a Visiting Scientist and Lecturer at the Institute of Cell Biology in Shanghai, China.

Dr. Fleiss was appointed to the Board of Directors of the National Commission on Confidentiality of Health Records. Dr. Jacob Furth was named Fogarty International Scholar at NCI. Dr. Gruenberger was guest lecturer for the National Cancer Center Research Institute, Tokyo, Japan. Dr. Eric J. Hall served on the Radiation Study Section of the National Institutes of Health and on the Editorial Boards of *Radiation Research* and the *International Journal of Radiation Oncology*, and on the high LET Committee of the U.S.-Japan Cooperative Cancer Research Program. Dr. Huang was awarded First Prize for Basic Research in Otolaryngology by the American Academy of Ophthalmology and Otolaryngology.

Dr. Kabat lectured and visited laboratories in the People's Republic of China at the invitation of the Institute of Biophysics of the Chinese Academy of Sciences and participated in a WHO course at the Weizman Institute in Rehovot, Israel. Dr. Lattes received the ASCP Award for Distinguished Service

to the Commission on Continuing Education of the American Society of Clinical Pathology.

Dr. Marks continued as Editor-in-Chief of *Blood*, the Journal of the American Society of Hematology. He was Mayne Guest Professor in Biochemistry at the University of Queensland, Australia. He was appointed Member, Technical Board of the Milbank Memorial Fund. Dr. Morrison was appointed to serve on the Allergy and Immunology Study Section. Dr. Osserman was selected to participate in the American Cancer Society's clinical program in interferon. He spoke at the Conference on Remedies for Biomedicine. Dr. Pernis lectured at Cornell University's Fifth Annual Strasburger Symposium and at the Sixth International Convocation on Immunology.

Dr. Harald H. Rossi is a member of the International Commission on Radiological Units and Measurements (ICRP), the National Commission on Radiological Protection (NCRP) and Chairman of the Mayor's Technical Advisory Committee on Radiation, City of New York. Dr. Spiegelman was Hoffman-LaRoche Lecturer in Microbiology at Rutgers University and was Arnold Welch Lecturer at Yale University. He also gave The Fourth Tykociner Lecture at University of Illinois, Urbana. Dr. I Bernard Weinstein was elected to the Institute of Medicine of the National Academy of Sciences. He was also appointed to the Scientific Advisory Board of the International Agency for Research on Cancer, World Health Organization and the Scientific Advisory Committee of the Sidney Farber Cancer Institute.

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Center for Community Health Systems

ROBERT J. WEISS

Director

With the general curtailment of federal funding for health services research, the Center has had to seek other sources to continue its research programs. The outlook for future funding is even more bleak in view of the President's directives for a drastic cutback in federal spending on all fronts. Despite this, the work of the Center has proceeded with some increased activity in areas of diverse problems in the organization and delivery of health care. Major effort has been expended in projects which address reorganization of care in the affiliated hospitals of the College of Physicians and Surgeons.

The regionalization of health care services has been addressed through the Ad Hoc Inter-Institutional Committee to Consider Regionalization of the Columbia affiliated hospitals, appointed by Dean Tapley and chaired by the Director of the Center. A major study was done on the merger of the In-patient Pediatric Services of the St. Luke's Medical Center and The Roosevelt Hospital. Because of the difficult reimbursement system in New York State, it was found that if the two services were to be merged in one institution, the effect would be an immediate financial loss to the hospital closing the service. This closing would affect the reimbursement rate for all of the other beds. More striking was the fact that the hospital which operated the combined in-patient pediatric service would benefit mildly for two years, but would then lose money because of an adverse effect on the general reimbursement rate after the two year period. This study shows clearly that regionalization of services cannot go forward until the State reorganizes its reimbursement formula. Ef-

forts are going forward in this area and Professor Bruce Vladeck of the Center has been appointed by Governor Carey to the State Council on Health Care Financing, recently created by the Legislature to devise a new system of hospital financing.

Research and Development

The Center has continued to focus on policy and operational issues in the delivery of health care.

Specialized Critical Care Units

Containing the costs of health care is a national health care priority. A significant portion of health care expenditures are for high-technology specialized critical medical care units. These units represent major capital investments and plans for construction or modifications must be reviewed by local health systems agencies. The decision whether or not to invest in new critical beds is a complex one which must consider both the benefits and costs.

A research grant jointly sponsored by the National Center for Health Services Research and the Bureau of Health Planning and Resources Development has been awarded to the Center to study these issues. Under the direction of Dr. Mark A. Sherman, this project will review and synthesize all existing research and analyses related to the planning of specialized critical care units such as facilities for burn and spinal cord injuries, neonatal, coronary and intensive care. The work will result in a guide book outlining the important questions which must be asked by health systems agencies, and the criteria which will

help them make objective judgements about the benefits and costs of proposed critical care units.

Patient Compliance in Preventive Dentistry

During this year a larger study team under Dr. Mata K. Nikias, including Dr. Stanley Budner, Mrs. Norma Agatstein, Mrs. Nancy Budner and Mrs. Esther Goldfarb completed the data collection and processing of the study of patient compliance to preventive dentistry regimens. The study is designed to determine rates and correlates of compliance with home oral care regimens for the prevention of dental diseases. The samples are 290 adult patients who have received instructions for plaque control at the University's Dental Hygiene Clinic and 477 adult patients who have received such instructions at nine participating private dental offices specially selected because they incorporate preventive dentistry in their practices. Data were collected by a crew of dental hygienists who were trained and calibrated in the techniques of interviewing, recording a gingival index and observing and rating the respondent's performance of oral hygiene techniques. These three types of compliance data—self reported, observation of skills, and gingival tissue status—are to be analyzed to measure compliance and they will be used to identify the relationship of compliance to many sets of factors relating to the preventive programs and to demographic, social and psychological characteristics of the patient.

Blue Cross/Blue Shield

Under a contract with Blue Cross/Blue Shield of Greater New York, Drs. Allen Ginsberg and Mark Sherman are examining the factors associated with the utilization of diagnostic laboratory and x-ray services. In addition to analyzing aggregate data from all hospitals in the New York region, they are collecting and exploring detailed utilization data on ten diagnoses from about 12 hospitals, searching for significant relationships between rates of utilization and selected independent variables. The ultimate aim of this research is to develop ways in which the rate of increase in the utilization of these services can be better controlled.

Regional Perinatal Network

The Center has continued its involvement, under the direction of Dr. Ginsberg, in the development and operation of the Regional Perinatal Care Network in upper Manhattan (see Obstetrics and Gynecology for additional details). A major accomplishment has been the further strengthening of Babies Hospital's Neonatal Intensive Care Unit (NICU) in terms of

staffing, and management capabilities. The unit is now operating at very high levels of occupancy and effectively serves as the regular source of tertiary referrals for all the Network hospitals. In addition, Purlaine Lieberman has been developing staffing and equipment standards for tertiary NICU's that can be used for planning in other regions. Under Sheila Gorman's direction, the Network's outreach and education programs have been expanded to include a program of training for New York City Department of Health outreach workers who will participate in the Network's outreach activities as a part of their regular duties.

Coordinated Emergency Care Project

Under the leadership of Dr. Allen Ginsberg and Dr. Michael Stewart, Chief of the Division of General Medicine, the efforts to improve and coordinate emergency services in the four Columbia affiliated hospitals have resulted in substantial advances. Policies for inter-hospital transfer of patients for admission from one emergency room to a bed in another hospital, without repeat of the admission decision process, have been agreed upon and are currently in effect on a trial basis between two of the four hospitals. A telephone in St. Luke's Hospital's emergency room has been established to facilitate the sharing of the Poisindex system, originally purchased by St. Luke's, and now cost-shared by the Project. Development and pilot testing of a new system for monitoring the process of care in the emergency rooms is progressing and the methodological approach has generated expressions of interest by funding agencies and emergency room personnel. A study of ambulance arrivals to the four hospitals has revealed much about the quantity and type of patients who appear by this mode and has provided useful information on their overall impact on the hospitals. To examine the issue of the use of multiple emergency rooms by the same patient, Purlaine Lieberman is currently analyzing data from six months of visits to Roosevelt and St. Luke's Hospitals to estimate the extent of cross-utilization.

Ambulatory Care Group Practice

Working with St. Luke's Hospital Center, under a grant from the United Hospital Fund, Drs. Weiss and Ginsberg are investigating the feasibility of on-site and off-site primary care group practices which would provide much of the primary care currently delivered by selected clinics in the hospital. They would also reach into all segments of the area's population to provide a single source of primary care and referral of high quality that would be financially self-

sufficient. The practice, which would make optimal use of physician extenders, would offer both fee-for-service and capitated payment options. A telephone survey of residents in this area, performed by a consultant under the Center's direction, reveals a substantial population who, dissatisfied with their current sources of care, would utilize such a facility. We are currently planning the operations, staffing and financing of a practice to fill these needs.

Merger Feasibility Study

The St. Luke's Medical Center and The Roosevelt Hospital Boards of Trustees voted to study the feasibility of merging these two hospitals which serve a defined population of 450,000 people. The feasibility study, funded by a consortium of foundations, involves complicated legal, financial, architectural, organizational and technical issues. The Center has played a policy role in helping to define and research a number of the issues involved.

The development of a projection of bed needs and utilization of the combined institutions involved a complicated computer simulation which was carried out under the direction of Dr. Allen Ginsberg with the assistance of Research Associate Bonnie Wlodkowski.

In addition, the Center has made a careful study of the demographic data necessary to support an application for an operating certificate for the combined institution.

Staff of the Center have played a major role in defining other studies and planning regarding the interaction with State and City health agencies which must approve of the merger.

Ambulatory Care Group Practice Satellites

Overlook Hospital has received one of eight nationwide grants for residency training in Primary Internal Medicine and Primary Pediatrics. In order to provide adequate sites for the ambulatory care training portion of the residencies, it was decided to develop two satellite Group Practices in areas underserved by the Hospital. The Center participated in the planning and structure of the satellites. The overriding consideration was the development of a plan and program which would be a model group practice, but which would be self supporting, including training costs and residents' stipends, by the end of the grant period in three years time. The model is unique in this aspect and anticipated the federal withdrawal of support of manpower training.

Admissions Scheduling System

The Center has made a study of the admissions

scheduling and operation of the admissions office of the Overlook Hospital. Major problems were found in the current system and the Hospital has asked the Center to develop a program which would provide for the development of an orderly process of admissions scheduling with maximum bed utilization and minimal patient delay and waiting. Drs. Allen Ginsberg and Mark Sherman have studied the process and submitted a proposal for the development of a model admissions scheduling system.

It is hoped that this model would have general applicability with specific modifications for other hospitals.

Dental Manpower

The Center, in conjunction with the School of Dental and Oral Surgery, is carrying out an evaluation of the impact of regional licensing on the distribution of dentists under a contract with the Bureau of Health Manpower, HRA. The purpose of this study is to determine, from existing data sets, whether regional licensing leads to greater mobility among dentists and to a more equitable distribution of dentists in relation to population.

Social Work Training in Primary Care

The School of Social Work has just received NIMH support for a major project on Social Work Training in Primary Care. The Center, which was involved in the development of the project from its inception, will be responsible for the evaluation component.

Clinical Scholar Program

The Columbia University Clinical Scholar Program entered its final year of funding from the Robert Wood Johnson Foundation in 1978. Three Clinical Scholars, one each in Medicine, Pediatrics, and Psychiatry, are currently being supported for a variety of projects including epidemiological approaches to health planning, applied medical sociology, and rural mental health systems. Selected aspects of the Clinical Scholar Program will be gradually merged with other academic activities on the Health Sciences Campus so as to ensure the continuation of certain interdepartmental efforts in the areas of applied health services research, clinical epidemiology, and the assessment of medical technology.

Nursing Home Policy Study

During 1978, Professor Bruce Vladeck devoted most of his time to completion of his research on public policy towards nursing homes, under a contract with the Twentieth Century Fund to direct a

broadscale national study of this issue. To gather source materials, he has interviewed many Federal officers and visited a large number of states which are representative of the diversity in nursing home policies. Professor Vladeck's book on the subject will be published next year.

Ethics and Values in Health Care

The Center is providing space for a research project in Ethics and Values in Health Care. Associate Dean Bernard Schoenberg is the Principal Investigator with Professor Steven Marcus (English) and Professor Richard Kuhns (Philosophy) representing the Humanities. Project Staff, including fourteen research associates, use the Center for educational meetings, planning, and discussion. The project's goal is to develop a series of clinical cases involving conflict situations in the areas of ethics and values; these will be primarily videotaped materials with extensive interdisciplinary discussion and examination. Such clinical materials are urgently needed by the proliferating ethics courses in American medical schools. The project is supported by grants from the Mallinckrodt and van Ameringen Foundations.

Comprehensive Bibliography on Rural Mental Health

Under a personal services contract with the National Institute of Mental Health, Dr. Robert Weiss supervised Dr. James Flax in the preparation of an annotated comprehensive Bibliography of Rural Mental Health Services and Rural Mental Health Care. The bibliography is being published by the National Institute for Mental Health for nationwide distribution.

Technical Assistance and Consultation

CCHS staff have continued to offer technical assistance to hospitals, and agencies at the federal, state,

and local levels. Professor Vladeck has served on the State Health Advisory Council as well as on the State Council on Health Care Financing. He has been a guest lecturer at New York University, Massachusetts Institute of Technology, and the University of Pittsburgh.

Professor Robert Weiss has been a consultant to the Federal Trade Commission, the National Institute of Mental Health, the National Center for Health Services Research, the United Hospital Fund, the New York State Health Advisory Council, and the Health Systems Agency of New York City. He has also represented the Association of New York Medical Schools on the Board of the Health Systems Agency of New York City, and continues to serve on three committees of that agency: Chairman of the Long Term Care Committee; member of the Plan Development Committee; and member of the Regionalization Committee. Professor Weiss is a member of the Editorial Board of the *American Journal of Public Health* and two other journals in the health care field.

Professor Allen Ginsberg is an associate editor for health care issues of *Management Science*, and a member of the New York Academy of Medicine's sub-committee on evaluation of Medical Care Audits and the Emergency Medical Services System's sub-committee on patient tracking.

Dr. Mark Sherman is a consultant to the National Center for Health Services Research.

Education and Training

Center personnel have contributed to the teaching in the Medical School, School of Public Health, Nursing School, and Department of Political Science. Staff members are acting as thesis advisors for students in doctoral programs and for master's theses in the School of Public Health.

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Gertrude H. Sergievsky Center

MERVYN SUSSER

Gertrude H. Sergievsky Professor and Director

Founding and Recruitment

The Gertrude H. Sergievsky Center, endowed in August 1977, is dedicated to the epidemiology of epilepsy and cerebral palsy, or in broad terms, to the epidemiology of developmental brain disorders. The Center is multidisciplinary, and has strong ties with the School of Public Health and the Department of Neurology, as well as with other departments (Pediatrics, Human Genetics, Psychiatry and the Psychiatric Institute). Mervyn Susser (Professor of Epidemiology) was appointed its first Director. As of July 1, 1978 he has relinquished his position as Head of the Department of Epidemiology to devote full time to the Center. Dr. Allen Hauser (previously Associate Professor of Neurology at the University of Minnesota) has been appointed Associate Director.

The first year of activity was dominated by recruiting a faculty and consolidating a research group. By the beginning of the 1978 academic year, key faculty were in position in the Center. Major strength had accrued to the Center from the affiliation of the Epidemiology of Brain Disorders Department of the Psychiatric Institute (Director, Dr. Zena Stein), which is now located in the Center. The research scientists of the Department all have appointments in the Center (Drs. Lillian Belmont, Holger Hansen, Jennie Kline, Zena Stein and Ms. Susan Zayac). In addition to these, a number of new appointments have been made jointly between the Epidemiology of Brain Disorders Department and the Sergievsky Center (Drs. Richard Neugebauer, Nigel Paneth, Stephen Shafer). A majority of the faculty of the

Sergievsky Center hold academic appointments in Public Health, one in Neurology and Public Health, one in Pediatrics and Public Health, and one in Pediatrics and Human Genetics. The Associate Director (Dr. Alan Hauser) holds an academic appointment in Neurology. Two members of the Department of Neurology (Drs. Eli Goldensohn and Richard Masland) also hold appointments in the Sergievsky Center. Thus the objective of assembling a multidisciplinary research faculty with cross-departmental ties has been fulfilled.

Research

The second main activity of the Center in its first year was to identify research objectives and formulate a program. By the nature of things, the major activity is continuing research which faculty have brought into the newly-established Center.

Thus the Epidemiology of Brain Disorders Department continues its program of research into the anomalies of human reproduction and into prenatal and postnatal factors in cognitive development, studies that have been extended by fresh funding during the current year (Drs. Kline, Stein, Susser and Warburton). In the area of human reproduction, the main developments have been the studies of the effects of environmental teratogens. The important finding that smoking is associated with spontaneous abortions is being followed further in terms of effects on cytogenetic abnormalities. Models for monitoring environmental teratogens are being applied in the field. In Creutzfeld-Jacob disease, a slow virus infection of the brain, a familial distribution has been

demonstrated among Libyan Jews (Rita Neugut, Zena Stein), a finding which raises intriguing theoretical questions about the interaction of genetic susceptibility and slow virus infection. The Department has pursued its strong interest in the prevention of brain disorders by focusing on prenatal screening programs and amniocentesis (Drs. Hansen, Stein and Susser) and neonatal screening for phenylketonuria (H. Hansen).

In the field of what might be called "cognitive epidemiology," studies of prenatal factors in cognitive development have concentrated on the effects of prenatal nutrition and other prenatal factors as well as on the postnatal environment. The publications from the major randomized control trial of prenatal nutritional supplementation among poor black women in New York City (Drs. Rush, Stein, Susser) have been readied for the press. The effects of maternal age on subsequent development have been studied in the 56,000 women who participated in the Collaborative Perinatal Project and in the cohort of children surveyed by the National Health Survey (Drs. Belmont and Stein and Ms. Zayac).

In the area of postnatal cognitive development, two main studies are underway (Drs. Belmont, Stein and Susser): 1) Cognitive development and developmental handicap in the City of Warsaw; 2) Studies of the effects of birth order, spacing and maternal age on developmental outcomes. The latter studies have used a variety of data sources, including the Collaborative Perinatal Project, the National Health Survey, and the national data of The Netherlands military inductions. A statement on the prevention of mental retardation, largely drafted by Dr. Stein with the help of Dr. Susser and other members of the Department, was adopted both by the International League of Societies for Mental Deficiency in Vienna, 1978, and by the International Association for the Scientific Study of Mental Deficiency.

New research has been launched in the field of cerebral palsy. A long-term program of investigation into the etiology of cerebral palsy has begun with a study of the effects of neonatal care on perinatal mortality and survival in New York City (Dr. Nigel Paneth), investigations ultimately to be extended to morbidity in the survivors. Whether the increase in survival has led to a rise or fall in the prevalence of neurological handicaps is an open question. In the field of epilepsy too, pilot work has begun on longitudinal studies of several birth cohorts, with a view to identifying risk factors. One cohort is in New York City, a follow-up of the Columbia Presbyterian sector of the Collaborative Perinatal Project, and another in Britain is a follow-up of national cohort of births in 1958 and 1970. To these cohorts may be

added an earlier cohort of births from 1946. Also initial descriptive studies of the profiles of seizures to be found at different levels of care in the Columbia-affiliated hospitals have begun (Drs. Neugebauer, Oppenheimer, and Susser).

Finally, Dr. Allen Hauser is continuing the work previously begun with data sets from Rochester, Minnesota and Minneapolis. His studies involve the identification of distinct familial seizure syndromes, the study of familial transmission of seizures, the social factors that influence the compliance of epilepsy patients with prescribed treatment and the time trends of cerebral palsy over a forty-year period. There is reason to believe that the frequency of cerebral palsy has been changing over time, and further, that the causal factors responsible can be identified.

Honors, Services and Activities

Dr. Eli S. Goldensohn was elected Vice President of the Epilepsy Foundation of America. He was appointed to the Board of Directors of the American Board of Qualification in Electroencephalography and was Chairman of the Board of Trustees of the Lennox Trust Fund. He was an invited guest at the 9th International Congress of the League Against Epilepsy in Vancouver, Canada; was Visiting Teacher at the Baylor University School of Medicine, gave a lecture series at the annual Colby College course in epilepsy, and directed the annual course in Clinical Electroencephalography given by the American Academy of Neurology.

Dr. Holger Hansen was appointed Acting Head of the Division of Epidemiology. He has served as Special Consultant to the New York City Amniocentesis Program and chaired its Committee on Records and Statistics. He consulted for the New York Legislative Committee on Expenditure Review and for the New Jersey Health Department on Neonatal screening programs for the Birth Defects Branch of the Center for Disease Control.

Dr. Allen Hauser leads a weekly seminar in the Columbia-Presbyterian Electroencephalography Laboratory. He has consulted for the Biometry Branch, National Institute of Neurological and Communicative Diseases and Stroke, and for the epilepsy programs of the University of Minnesota, the University of Oregon, and the Sergievsky Center, Seattle. He is a member of the Advisory Board on Epilepsy of the National Institute of Health, Chairman of the Laboratory Standards Committee of the American EEG Society, and Secretary-Treasurer of the Central EEG Society. He was a contributor to four papers and a seminar at the International Epilepsy Symposium in Vancouver.

Dr. Jennie Kline consulted for the Los Alamos

Scientific Laboratory, New Mexico.

Dr. Richard Masland is engaged in clinical trials of anticonvulsant drugs. He is a member of the board of the Epilepsy Foundation of America and the Samuel T. Orton Society and serves on the Medical Advisory Board of the National Multiple Sclerosis Society, the Myasthenia Gravis Foundation, and the National Genetics Foundation. He is on the Research Review Committee of United Cerebral Palsy and is a consultant to the National Institute of Neurological and Communicative Diseases and Stroke. At the International Epilepsy Symposium in Vancouver he gave the William Lenox Lecture.

Dr. Richard Neugebauer was a member of a work group reporting to the Task Panel on Problems, Scope, and Boundaries for the 1978 President's Commission on Mental Health.

Dr. Nigel Paneth has been appointed a member of the Consensus Committee on the Impact of Fetal Monitoring of the National Institute of Child Health and Human Development.

Dr. Stephen Shafer consults with Dr. Lewis Rowland, Chairman of the Department of Neurology, and Dr. Marcello Olarte on a clinical trial of levamisole in amyotrophic lateral sclerosis, and with Dr. David Shaffer, Professor of Clinical Child Psychiatry, on a study of neurological soft signs in adolescents.

Dr. Patrick Shrout gave a paper at the European Psychometric Meeting, Uppasala, Sweden in June, 1978, and he has consulted with the Harlem Hospital Rehabilitation Center concerning program reevaluation.

Dr. Zena Stein is a member of the Study Section of the Biometry Division, National Institute of Mental Health, of the National Foundation, March of Dimes Task Force in Genetics, New York Region, the International Committee on Prevention of Mental Retardation of the International Association for the Scientific Study of Mental Deficiency, and of the Advisory Committee of the Sudden Infant Death Syndrome Study of the National Institute of Child Health and Human Development. She is Associate Editor of

Biological Psychiatry, and of the *Journal of Research Into Down's Syndrome*. She was consultant for the Southeast Asia Region of the World Health Organization on mental retardation from July 1 through September 25th. She gave invited lectures to the Maimonides Medical Center, at the Workshop on Assessment of Reproductive Hazards in the Workplace of the Society for Occupational and Environmental Health, at the Symposium on Environmental Hazards, at the Society for Epidemiological Research in Iowa, at the National Institute on Environmental Health Sciences, to the students of Barnard College, and at the Department of Psychology at the University of Washington, Seattle. She also lectured at the University of Indonesia and the B. M. Institute in Ahmedabad, and she organized an intercountry workshop on mental retardation for the South East Asia Region of W.H.O. in New Delhi.

Dr. Mervyn Susser was appointed to the Gertrude H. Sergievsky Chair of Epidemiology. He was Chairman of the New York Heart Association Council on Public Education. He lectured at the University of Indonesia, the B.M. Institute at Ahmedabad, the Program in the Liberal Arts & Sciences Basic to Human Biology at the University of Chicago, and at the Department of Epidemiology of the University of North Carolina. He was a participant in the Columbia University Symposium on Semi-starvation Commemorating the Warsaw Ghetto Uprising and in the Memorial Symposium for George Rosen. Dr. Susser was chairman of a session of the meeting of the Epidemiology Section of the World Psychiatric Association at Washington University in St. Louis, and he carried out an evaluation of the Division of Epidemiology and Biostatistics of the University of Cincinnati.

Dr. Dorothy Warburton directs the Genetics Diagnostic Laboratory of the Presbyterian Hospital. She presented a paper on the Spontaneous Abortion Study at the plenary sessions of the National Foundation—March of Dimes Symposium on the Clinical Delineation of Birth Defects June 12-15, 1978.

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Reports of Women's Auxiliaries
The Presbyterian Hospital in the City of New York

Board of Women Managers of the Babies Hospital

MRS. MELVIN L. BEDRICK, *President*

1978 was the first year all subspecialties in pediatrics have been housed in the Babies Hospital. April of this year brought young orthopedic patients to Babies. With careful integration, those children are now a permanent part of our census. All of us at Babies welcome them. Our Board has worked with the New York Orthopaedic Hospital Auxiliary to provide the appropriate recreational therapy for these children and we are grateful to them for their participation and support.

Members from our Board worked closely with Drs. Sidney Carter and Peter Carmel on plans to improve the bathroom facilities on the eleventh floor. We were able to air condition the large wards and play area for the neurological patients. We also provided air conditioning for the large wards on the ninth floor north corridor which houses surgical and orthopedic patients. This has provided greater comfort for the children and better working conditions for our nursing and floor staff.

Our greatest source of income this year was \$26,188, from the Greater New York Fund Campaign. The United Hospital Fund brought \$17,680 with a direct benefit of \$5,928. The Free Care Distribution was \$2,580. Our theater benefit, "Da," was most successfully chaired by Mrs. Bayard Walker. Our Board realized \$15,414 from the evening. The Annual Lecture Series raised \$5,320.12, and we wish to thank Mesdames Lamont and Spurdle for their ongoing commitment to the series.

We continued to underwrite, in part, a recreational therapy salary in the amount of \$9,819.04. We gave \$4,500 to the Recreational Therapy Program. Our

Social Service Department received a partial salary of \$13,885.97 from Board monies. We appropriated an additional \$1,125 to that department to be used at its discretion.

Again this year we supported the Pediatric Psychiatric Clinic in the amount of \$1,500.

Our new Recreational Therapy area continues to work well under Miss Phillips' supervision. We welcome two new therapists, Nanci Dickman and Linda Hemphill, whose salary is paid by the Board of the New York Orthopaedic Hospital.

The library has become very popular. It is a great help to those children who are temporarily unable to use their hands for crafts.

For the first time the recreational area is available to patients on the weekend. Saturday's film program has been well received and the playroom is open to patients Sunday afternoons. This has been achieved by the generosity of the staff and their willingness to rotate their schedules.

Our playroom and classrooms have been available to Mildred Abbott and Elizabeth Graham's parenting group from the Department of Obstetrics and Gynecology. We are very pleased to share this space with them.

Our playroom had 20,469 patient contacts during the year; the classrooms had 2,089 visits.

Our thanks to Mrs. Diamond who continues to provide able volunteers throughout Babies. Adults and Candy Strippers support various patient programs. The greatest number of volunteers in a single area was 72, representing 7,134 helping hours in Recreational Therapy.

Our Board accepted with regret the resignation of Mrs. George Crawford, Jr. We welcome Mrs. Timothy Healy, our new member.

We have worked closely with the Department of Nursing, and in response to a request from them, established a "coffee" on the ninth floor. Mrs. Millard carefully organized and initiated this project, which was supported by volunteers from our Board. Mesdames Bigotte, Braga, Evarts, Millard and Walker each volunteered one day a week to pour coffee and interact with patients' families. The project was well received by all.

We are grateful to Mrs. Braga, who has agreed to chair the 1979 Lecture Series to be held in the spring. Our speakers will be Drs. C. Andrew Bassett, Gabriel Nahas and Anthony Donn.

We were fortunate in having a long and distinguished list of speakers this year. We wish to thank them for their participation at our meetings. They included William Chambers, M.D., Nicholas Cunningham, M.D., Mr. Eugene Daly, Bernadette Fiscina, M.D., Arthur Green, M.D., Mrs. Judith Jones, Michael Katz, M.D., William Lupatkin, M.D., Joaquim Puig-Antich, M.D., and Alan Rosenfield, M.D.

Our annual lunch was held in the Faculty Club immediately following our April meeting. It was well attended by Board members as well as staff and

members of the Administration.

We have enjoyed working with the associate department heads, Miss McConville, Miss Dilworth and our Unit Manager Miss Cavanagh. We extend special thanks to the Office of Public Interest and Mrs. Kathleen Thompson for her endless time and secretarial support.

Our Board has worked closely with the other Auxiliaries throughout the year. Joint projects have included support of the Presbyterian Art Show and the planting and maintenance of the Hospital's garden. We have voted to hold a joint Auxiliary Benefit in the spring of 1979. The proceeds will be equally shared. We have enjoyed working closely with the other Auxiliaries and look forward to future cooperation on joint Auxiliary projects.

We are most fortunate to have the continuing interest and unbounded support of Dr. Demartini, who is always available to members of our Board. We want to thank Dr. Ryder, Mr. Noroian and Mr. Peters for their willingness to counsel and direct our varied activities.

In the complex and uncertain times ahead for our Hospital, it is the intention of our Board to participate fully in support of the Administration, and the staff. Primarily, we will continue to address the non-professional needs of the Babies Hospital, our children and their families.

Cribside Social Service Committee

MRS. WILLIAM E. HILL, *Chairman*

The Cribside Social Service Committee of the Board of Women Managers of Babies Hospital continued in 1978 its practice of focusing on the needs of our young patients and their families. We do this through our Social Service Department which carries out its mandate in terms of the social component in the delivery of medical care. Our children's needs are varied. Social work intervention is needed in the areas of Child Abuse, terminal and chronic care problems, placement (for nursing or rehabilitative care, foster care) home care regimen, specialized school placements, Sudden Infant Death Syndrome, referral for psychiatric intervention and the like.

We are especially grateful to Mrs. James McCosh

Magie who this year gave a sizeable donation to the work of Social Service. We are also grateful to Mr. and Mrs. K. Herluf Trudso for their Christmas remembrance each year. Mrs. Trudso is no longer a Cribside member but her interest remains with us.

Cribside continues to send our physically handicapped children to summer camp and to approve the use of our Endowed Beds for needy youngsters.

I continue to be most grateful to all members of the Cribside Committee for their untiring efforts on behalf of our young patients. I am also grateful to Miss Agnes D. Dilworth and her competent staff of social workers for their contribution to patient care.

Neurological Institute Auxiliary

MRS. HART FESSENDEN, *Chairman*

The Neurological Institute Auxiliary had a productive year in 1978 as we continued to expand our efforts at Neurological Institute, and we began a close working association with the other Presbyterian Hospital Auxiliaries.

Despite the fact that we had no benefit this past year, our fund raising efforts brought good results because of an increased contribution from The Greater New York Fund over the previous year and because the Thrift Shop raised substantially more than was budgeted. It was also a good year for donations to the Auxiliary.

Miss Elizabeth Kerr ran the United Hospital Fund Drive for the fine showing of \$28,572 raised from a total of 135 gifts. Through Mrs. John Weinberg's leadership, our Box Week total was \$415. The Auxiliary received from the United Hospital Fund \$10,302 for the care of ward and clinic patients at the Hospital and \$5,000 for the Neurological Institute Library. We, also, received \$2,314 for the Auxiliary's general funds under the title of free care distribution. Our contribution from The Greater New York Fund was \$15,864.

The Thrift Shop continued to operate under Mrs. Royall Cannaday's dedicated guidance, with the help of Mrs. Niels Low, Mrs. H. Houston Merritt, Mrs. Gordon Pyle, Mrs. Edward Schlesinger and Mrs. Charles Stroud. From a total of \$32,695.38 in sales, \$17,501.52 was distributed to the Auxiliary, a substantial increase over 1977.

With Mrs. Charles Adams acting as almoner, we received \$500 from the Haven's Relief Fund, the Society for the Relief of Women and Children, again,

gave the Auxiliary \$600, and the Sasco Foundation, \$1,000.

Auxiliary projects were many and varied. To the Milbank Library and the Volunteer Service we donated \$8,000 and \$1,900, respectively, and we continued to contribute \$5,000 towards the salary of the nurse specialist in the Neurology Clinic. This position, filled by Mrs. Barbara Stein followed by Ms. Michele Madonna, helps over 250 clinic patients and supervises the aftercare of those who need follow-up help in their safety and home care plans after their hospital discharge.

Mrs. Niels Low oversaw our activities in the Pediatric Neurology Clinic playroom, where the Auxiliary pays the salary of a student recreational therapist at the Wednesday afternoon sessions of the children's clinic. Miss Rena Mattison, our therapist, provided educational and recreational projects for waiting children. The Auxiliary donated and wrapped Christmas presents for the children and Mrs. Low, Mrs. Richard Masland and Mrs. Schlesinger hosted a Christmas party for them and their parents.

Our recreational therapy program continued at the Institute with the support of Mrs. S. Lytton Scott and Mr. Eldon Sullivan, with the help of Dr. John Downey. Miss Andrea Fitzgerald worked as our part-time therapist, mainly with rehabilitation patients on the 8th floor.

Our gift cart project was conducted by Mrs. Hilary P. Reddy with the help of Mrs. W. Jost Michelsen. The cart was circulated to patient floors two days a week for the benefit of patients, staff and visitors.

Through the gift cart outlets, Mrs. Reddy bought Christmas presents for the patients with contributions from Auxiliary members, and they were wrapped by the members and given to the Nursing Department for distribution on Christmas day.

For the first time, awards contributed by the Auxiliary of \$100 each and a citation were given to four ancillary help employees for outstanding performance in their jobs. A ceremony took place in April at Neurological Institute. Dr. Felix Demartini presented the awards, and Auxiliary members hosted the occasion, which will take place annually, sponsored by the Auxiliary, to encourage good morale at the Institute.

Our contribution to Social Service activities was for patient care needs (transportation, home equipment and appliances, homemaker costs and maintenance) \$1,328.90, and for summer camp \$300.

Three electric beds were given to the Institute with funds raised by Mrs. Carl T. Chadsey.

Under Mrs. Richard Bliss' able and talented guidance the two patient waiting areas in the Neurological X-Ray Department were refurbished to the pleasure of both patients and staff. They provided comfortable and cheerful waiting space in a crowded and otherwise drab basement environment. Through Mrs. Bliss' generosity, the Auxiliary was able to realize a considerable financial saving on the project.

Our Auxiliary gave \$250 to the Presbyterian Hospital for plants and seeds for the Hospital grounds, as did each of the other three Auxiliaries.

The Hospital-wide art show was reinstituted, with great enthusiasm and excellent participation, in May sponsored by the four Auxiliaries together with a Hospital committee led by Ms. Ida Nathan. All members of the CPMC community were invited to exhibit their works and there was a wine and cheese party opening hosted by the four Auxiliaries. It is intended to have this an annual event.

At year's end, we have begun working in two new areas:

At the request of Mr. Kevin Dahill, the Hospital's newly appointed Coordinator of Patient Relations, the Auxiliary is helping him at Neurological Institute. Mrs. Carl Chadsey is our representative in this effort.

Several of the Auxiliaries are involved together in a project with Dr. John Roglieri in the Vanderbilt

Clinic. After an orientation session, Auxiliary members will be available three afternoons a week, and one morning, as a "caring presence" to aid waiting patients with questions and non-medical needs. It is an effort to make their visits more humane and another attempt at better community relations. Mrs. Richard Fay and Mrs. Stephen Mallory will work on this project for our Auxiliary.

The Auxiliary had two speakers at meetings this year. Andrea Fitzgerald, our recreational therapist, spoke to us in May, and Dr. Linda Lewis, Director of the Neurology Clinic, spoke in November of current operations and future plans in the Clinic. The Neurological Institute Social Service Department gave its annual presentation at the December meeting.

The Auxiliary had a luncheon at the Faculty Club after the May meeting for members of the Nursing Service and after the December meeting for the Social Service Department staff.

It is with sadness that I report the deaths of two associate members, Mrs. Alvin Brush and Mrs. James Mackenzie. Two active members resigned from the Auxiliary, Mrs. Charles Bryan and Miss Elizabeth Kerr. Mrs. Julius Phoenix, Jr. became an associate member from an active one, and Mrs. Frank Boschenstein was elected a new member.

The Auxiliary was represented at the monthly meetings of the Patient Care Committee, and at the meetings of the Department of Neurological Surgery. My thanks go to Dr. Daniel Sciarra and Dr. Edward Schlesinger for their courtesy in giving us these opportunities.

As my term of Chairman of the Neurological Institute Auxiliary ends, I'd like to thank my colleagues on the Auxiliary for the grace, style and professionalism with which they have conducted Auxiliary matters, and for the cheerful and faithful support they have given me in all of our efforts.

My sincere gratitude goes to the dedicated men and women who work at Neurological Institute, who have allowed us to strive in partnership with them for the best in patient care, and who have extended us their help and unfailing support.

My special thanks to Mrs. Kathleen Thompson in Public Interest for her competent administrative and secretarial help, and, finally and importantly, to Dr. Demartini and his colleagues in administration for their prompt and courteous attention.

Women's Auxiliary of the New York Orthopaedic Hospital

MRS. HUGO A. KEIM, *President*

This year has been a very successful one for our Board. We have enjoyed having more speakers at our monthly meetings. We have also been kept well informed by having Dr. Alexander Garcia, Director of Orthopaedic Surgery, and Dr. Charles T. Ryder, Executive Vice President for Planning and Medical Affairs, meet with us at various times during the year to discuss the future of the Medical Center.

At most of our monthly meetings we have had reports from Miss Rosemary Hoynak, our head nurse. She keeps us informed of the needs and happenings of the patients and the nurses. Also, a guest at our monthly meeting is our recreational therapist, Mrs. Lisa Jantzen. She and her volunteers are con-

tinuing to help the patients, and our Auxiliary receives much praise from the patients about their work.

Our ladies continue to make great strides in the efforts on behalf of the United Hospital Fund drive.

The budget for the year included support for the care of ward and clinic patients and many other worthwhile efforts.

I wish to thank all the members of the Board for their continuing support. I feel privileged to work with the members of the Women's Auxiliary of the New York Orthopaedic Hospital, and look forward to a continuing productive future.

Presbyterian Hospital Auxiliary

MRS. GILBERT J. VOSBURGH, *President*

In the fiftieth year of the Medical Center the Presbyterian Hospital Auxiliary also had a birthday. Founded in 1908, we became 70 years old! In celebration, our January meeting program was a retrospective of the achievements and activities as related by ten of our past presidents who are still active members. Moderated by Mrs. George A. Perera, the panel consisted of Mrs. Ralph H. Boots, Mrs. Frederick R. Bailey, Mrs. Hamilton Southworth, Mrs. Philip D. Wiedel, Mrs. A. Gerard DeVoe, Mrs. Francis H. Cabot, Mrs. W. Duane Todd, Mrs. George A. Carden and Mrs. John Van B. Dean. We are proud of our innovative role, having been instrumental in the organization of the Social Service and Volunteer Departments, the Milbank Library and the Occupational Therapy and Recreational Therapy Departments. Complete financial responsibility for some has been accepted by the Hospital, while others are still partially or fully funded by the Auxiliary. We take pride in our past achievements and strive today to remain creative and to expand our horizons, but at the same time to support past projects which have proved to be essential.

As the Hospital becomes more strictly regulated by government, we have enlarged our activities in the legislative field. Mrs. Equinn W. Munnell and I attended the American Hospital Association Annual Meeting in Washington in February. There we had an opportunity to listen and learn while at the same time talking personally with New York City Representatives in Congress, especially Congressman Theodore S. Weiss who represents District 20 in which the Medical Center is located. We were delighted to be

joined by Dr. Felix E. Demartini, Mr. Thomas H. Choate and Mr. Joel Van Wynen for part of the program. Mrs. Munnell, Mrs. Tyson and I also went to Albany with the Delegation from the Division of Voluntary Programs of the United Hospital Fund in March. At this time we were able to talk with both our Assemblyman and our Senator for our District. As a result of this trip, Senator Franz S. Leichter continued to stay in touch with us and came to talk to the Auxiliary at an open meeting in November. This was the first time such an event had occurred and the results have been gratifying. We appreciate the recognition given us by the Hospital administration for our efforts in this field. Plans are being made for an ongoing legislative program so we can become more effective in the future.

Success in the form of \$15,000 from United Hospital Fund came to The Presbyterian Hospital as the result of a grant proposal in which the Auxiliary participated. Mrs. Maxwell Abramson worked with me, along with Ms. Elizabeth Graham from the Social Service Department, Ms. Mildred Abbott, Nurse Midwife, and their associates, in preparing a proposal for a vocational guidance component in the post-partum aspect of the Young Parents Clinic Program under the direction of Dr. Allan Rosenfield. Besides providing much needed help for these patients, this innovative program allows us to become active in community outreach and expands the kind of volunteer opportunities we can offer to members.

Mrs. Equinn W. Munnell, Mrs. George D. Barson and I were invited by the Public Interest Department to be hostesses at a luncheon and tour guides for

The Presbyterian Hospital when the International Hospitality Committee of the National Council of Women spent the day at the Medical Center. We were joined in this by representatives of the other Auxiliaries.

In fact, 1978 has been a year of increased cooperative ventures by our Auxiliary with the Board of Women Managers of the Babies Hospital, the Neurological Institute Auxiliary and the Women's Auxiliary of the New York Orthopaedic Hospital. Together we helped set up and sponsor the Art Show which was open to all staff of the Medical Center. Those who participated expressed pleasure in having an opportunity to show their paintings, photographs or sculptures and to share their common interest with each other and all who came to the exhibition. As 1978 ended, the four Auxiliaries were working with Dr. John Roglieri to set up a pilot program providing volunteers to assist patients in the Vanderbilt Clinic. Mrs. Alfred J. Lignon will be our representative; her unfailing devotion to the Clinic having been demonstrated by fifteen years' work at the Patient Service Desk.

The Presidents of the four Auxiliaries met on several occasions to plan ahead for a joint benefit in 1979, an effort which we hope will work well and become an annual event. Presbyterian Hospital Auxiliary's benefit in 1978 was again a Gala Promenade Concert of the New York Philharmonic at Lincoln Center. Preceded by a dinner at a nearby restaurant, it was held in May under the able Chairmanship of Mrs. Bruce D. Williams with Mrs. John Packard as Vice Chairman assisted by an enthusiastic committee. Dr. and Mrs. George A. Carden graciously consented to be Honorary Chairmen of this delightful evening, which netted \$11,938.

United Hospital Fund also had an anniversary year in 1978—their 100th. Mrs. George D. Barson has been a very diligent Chairman of this part of our fund raising program, increasing the number of Auxiliary members who participated and encouraging efforts to add names to our list. Mrs. Ralph H. Boots is outstanding, having written 200 letters! To date we have raised \$30,171.00 from 253 gifts for the 1978 campaign.

Dr. Vosburgh and I appreciated the opportunity to represent our Auxiliary at the United Hospital Fund 100th Anniversary Dinner by being guests at one of the Hospital's tables. Concern at our disappointing receipts from the Greater New York Fund and the Free Care Distribution of the United Hospital Fund led to discussion with administration and other auxiliaries about the internal formula for distribution of these monies. A new criterion will be based on a five year rolling average of campaign results and will

produce a distribution more fairly representative of each Auxiliaries' earnings. In 1978, \$9,970 from the Greater New York Fund and \$1,455 from Free Care Distribution of the United Hospital Fund was received. Our direct benefits to be used for the care of ward and clinic patients totaled \$11,319 this year. These figures are a result of the 1977 campaign, our chairmen having been Mrs. Albert R. Perry, Jr., who with her workers procured 371 gifts totaling \$30,289. We continue to benefit from the Division of Voluntary Program's activities at the Fund and have subscribed to the 100th Anniversary series of seminars. Mrs. Maxwell Abramson attended the first one and reported to the Auxiliary. The subject was perspectives on the Self-Care Movement. Other members will represent us as the series continues into 1979. As reported previously, several of our members serve on standing committees at the Fund.

We remain as a member of the Stuyvesant Square Thrift Shop with Mrs. Carl R. Feind as our Chairman. Under her enthusiastic leadership, our unit at the Shop has brought in a profit of \$26,229.06 this year. This is our largest source of income and we are indebted to the faithful group of members who labor long in the tasks necessary to turn such a handsome profit. Mrs. Equinn W. Munnell of our Auxiliary is President of the Board of the Stuyvesant Square Thrift Shop for the second year. Our thanks go also to those who have donated thrift without which we could not sustain this endeavor.

Our other merchandising effort, which is a direct service to patients and staff at the Hospital, is the Shopping Cart. It is impossible to express adequately our gratitude to Mrs. W. Duane Todd who helped us start the Cart three years ago and who has labored long hours buying appealing stock and effectively carrying on all other chores essential to the successful venture into which she has turned the Shopping Cart. We shall always be deeply indebted to Mrs. Todd for having been instrumental in turning a long cherished idea into a reality. Starting purely as a service project, by the end of 1978 the cart account had a balance of \$4,319.21. The plea for a Gift Shop is heard on all sides as the cart makes its rounds and we look forward to working with the other Auxiliaries in the initiation of this service.

The Auxiliary entirely supports the Recreational Therapy Program under the direction of Mr. William McKee. It has been gratifying to see recognition of the value of this service by Dr. Canfield's request for help with the clinical research patients on Presbyterian-4. This past year, 2,474 patients were served by Mr. McKee and his loyal volunteer staff.

We support the Milbank Library with \$10,050 annually and welcome the new librarian, Mrs. Sherry

Arfa, who has expanded the scope of the library services and has many fresh ideas for future projects. Mrs. John F. O'Brien is our Library Chairman and she reports that 18,655 books and periodicals were circulated to 10,416 patients and 2,542 staff members. The Talking Book Program, especially for patients who are visually handicapped but also for those with physical handicaps, has grown so that 499 patients were helped this past year. Mrs. Lawrence Bogert, daughter of Margaret and Jeremiah Milbank, has again given a generous gift of \$1,000 which aids the Library in maintaining its present excellence of service.

We also underwrite the Volunteer Department with \$7,200 annually and are indebted to Mrs. Dorothy Diamond, the Director, for her cooperation with us in supplying volunteers to help in many of our programs. Mrs. George A. Perera is our Volunteer Chairman and in this capacity she helped arrange the Volunteer Tea in May aided by Mrs. Robert Senkier as Vice Chairman and the staff of the Volunteer Department. Members of all Auxiliaries poured at this tea. Students from the Lincoln Center Ballet School, under the direction of Mr. and Mrs. Alfred J. Lignon, entertained engagingly following a talk by Mr. M. James Peters, Senior Vice President, Finance, Presbyterian Hospital.

The Auxiliary has given \$1,000 toward the Student Nurses Scholarship Fund, \$500 toward the Blood Bank Education Fund, \$500 to the Emily Webster Fund at the Medical Center Nursery School and has also contributed toward the purchase of plants and seeds for The Presbyterian Hospital garden, and to the purchase of holiday decorations around the Hospital.

None of these projects, as well as others unmentioned, would be possible without the willing and generous response of Auxiliary members when asked by me for their help. I have had heart-warming support on all sides and wish to congratulate the Auxiliary for their understanding of our obligations and willingness to come to the fore when needed.

The Hospital staff has been generous with their time in speaking to our members at monthly meetings. The late Dr. Daniel Kimberg told us in March of his hopes and plans for the Department of Medicine. Along with all others associated with the Medical Center, we were saddened by his sudden death. We value our association with Mrs. Kimberg as our liaison to the Nursing Department. In April, Mr. Edward H. Noroian, the then new Chief Operating Officer of The Presbyterian Hospital, was enthusiastically received as our speaker. Dr. Charles T. Ryder, Executive Vice President for Planning and Medical Affairs, came to our October meeting to outline the future plans for the Hospital and to answer

our many questions. We considered it a privilege to have been interviewed by teams from Perkins and Will and Llewelyn-Davies Associates, the consulting firms who were evaluating the Medical Center.

We appreciated the privilege of attending the monthly Monday luncheons with members of the Hospital Administration, along with representatives from the other three Auxiliaries. We feel that our association with Dr. Demartini, Dr. Ryder and Mr. Noroian has been rewarding. We also wish to express our hope that the Auxiliaries of the Medical Center will continue to work more closely together toward the goal of ultimately being combined into one organization, thereby becoming more effective in all our projects.

At our Annual Meeting in May, Mrs. Sven Kister was elected the new Recording Secretary and Mrs. Cornelius J. Tyson, Jr., was elected Corresponding Secretary. During the year the following changes in membership took place: From Active to Associate Member, Mrs. Francis H. Cabot and Mrs. Carl T. Nelson; resigned as Active, Mrs. Hugh Williamson; resigned as Associate, Mrs. W. Van Alan Clark, Mrs. Alvin Devereaux, Mrs. Richard J. Kossman and Mrs. Algernon B. Reese. We are always sorry to lose active members, but pleased when they stay with us as associates. Resignations are received with regret, and we are indeed sorry to learn of the death of Mrs. John H. Dunnington. On the more positive side of the ledger, we are pleased to welcome the following new members: Mrs. Charles J. Campbell, Mrs. Edward M. Ferris, Mrs. Frank E. Gump, Mrs. John J. Langan, Mrs. Edgar Leifer, Mrs. Joseph K. Slap, Mrs. Dobli Srinivasan and Mrs. Frances C. Symonds. We now have 56 active members and 41 associate members. With Mrs. Joseph K. Slap as Membership Chairman, we plan to expand our roster further, emphasizing the responsibility of active engagement in one of our programs as essential.

Our Finance Committee, under the Chairmanship of Mrs. Equinn W. Munnell, reviewed several proposals for funds and, after investigating each thoroughly, recommended that the Auxiliary give \$2,796 to Dr. Charles J. Campbell, Director of the Eye Institute, for the purchase of audio-visual viewers and cassettes to be used as aids in patient education.

As we look back on our 70th year, we take pride in having continued our role as innovators, meanwhile supporting existing programs. We anticipate moving ahead in other new areas as the Medical Center develops its plans for the future. Our commitment to the Hospital remains our foundation for existence, and we look forward to being an active part of future progress as this institution enters its second half century of service.

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 (Psychiatric Dental Service)
 Ellen N. Hosiosky, D.D.S.
 (Psychiatric Dental Service)
 Frances R. Karlan, D.D.S., M.B.A.
 Robert N. Schiff, D.D.S.
 David Zeisler, D.D.S.
 (Special Services)
 Edward Zerden, D.D.S.

ASSISTANT PROFESSOR

David J. Zegarelli, D.D.S.
 (also Pathology)

ASSISTANT CLINICAL PROFESSORS

William C. Baral, D.D.S.
 (Psychiatric Dental Service)
 Martin Bassiur, D.D.S.
 (Psychiatric Dental Service)
 John F. Capriccio, D.D.S.
 Daniel J. Cherico, PH.D.
 (Psychiatric Dental Service)
 Harold Darwin, D.D.S.
 John V. Donovan, D.D.S.
 Robert Gabriele, D.D.S.
 Berthold Kuerer, D.D.S.
 Marc H. Lorinsky, D.M.D.
 (at St. Luke's Hospital)

Gilbert G. Mazur, D.D.S.
 Stuart W. Osofsky, D.D.S.
 John D. Piro, D.D.S.
 (also Otolaryngology)
 Nicholas A. Vero, Jr., D.D.S.
 Bernard G. Williams, D.D.S.
 Thomas A. Wilson, D.D.S.
 Jerome A. Zane, D.D.S.

ADJUNCT ASSISTANT PROFESSORS

Victor I. Sendax, D.D.S.

LECTURERS

Frank V. Celenza, D.D.S.
 Angelo Chiarenza, D.D.S.
 Burney M. Croll, D.D.S.
 Paul E. Glassman, D.D.S.
 Dale E. Hopp, D.D.S.
 Howard B. Menell, D.D.S.
 Anthony Ricciardi, D.D.S.

INSTRUCTORS

John DeCarlo, D.D.S.
 James M. Eisdorfer, D.D.S.
 Bruce Goldenberg, D.D.S.
 Irving Golombeck, D.D.S.
 Karen S. Hammer, D.D.S.
 Albert J. Kurpis, D.D.S.
 Mark Lavine, D.D.S.
 Alan T. Rosenbloom, D.D.S.
 Robert B. Shapiro, D.M.D.
 Dante M. Torres, D.D.S.
 Joseph J. Veligdan, D.M.D.

Stomatology

PROFESSOR

Edward V. Zegarelli, D.D.S.,
 M.S. (Dean)

CLINICAL PROFESSORS

Herbert D. Ayers, D.D.S.

Appendix

EXHIBIT A

THE PRESBYTERIAN HOSPITAL

Balance Sheet
DECEMBER 31

	1978	1977
ASSETS		
UNRESTRICTED FUNDS		
Current:		
Cash	\$ 311,545	\$ 760,309
Investments at market, approximating cost	956,154	1,092,934
Accounts receivable	37,095,660	34,560,319
Allowance for uncollectible accounts	(6,564,857)	(7,528,967)
Supplies and materials	1,878,306	1,578,305
Accrued interest and prepaid expenses	2,603,106	1,492,000
Total current assets	36,279,914	31,954,900
Other:		
Investments at market (cost—1978, \$10,999,746; 1977, \$9,273,600)	15,994,681	14,458,387
Due from restricted building funds		8,450,000
Property, plant and equipment—net	78,494,872	83,033,811
TOTAL UNRESTRICTED FUNDS	<u>\$130,769,467</u>	<u>\$137,897,098</u>
RESTRICTED FUNDS		
SPECIFIC PURPOSE FUNDS		
Cash	\$ 487,511	\$ 393,887
Investments at market (cost—1978, \$20,452,977; 1977, \$17,760,980)	20,332,518	17,864,831
Due from unrestricted funds	7,772,769	5,841,580
TOTAL SPECIFIC PURPOSE FUNDS	<u>\$ 28,592,798</u>	<u>\$ 24,100,298</u>
PLANT REPLACEMENT AND EXPANSION FUNDS		
Investments at market (cost—1978, \$30,726,133; 1977, \$23,204,781)	\$ 31,045,268	\$ 22,859,999
Pledge receivable	400,000	600,000
TOTAL PLANT REPLACEMENT AND EXPANSION FUNDS	<u>\$ 31,445,268</u>	<u>\$23,459,999</u>
ENDOWMENT FUNDS		
Cash	\$ 544,247	\$ 2,685,671
Investments at market (cost—1978, \$63,474,434; 1977, \$58,930,646)	74,844,132	68,703,752
TOTAL ENDOWMENT FUNDS	<u>\$ 75,388,379</u>	<u>\$ 71,389,423</u>

See Notes to Financial Statements.

THE CITY OF NEW YORK

EXHIBIT A

leets

7 AND 1977

LIABILITIES AND FUND BALANCES 1978 1977
UNRESTRICTED FUNDS

Current:

Accounts payable	\$ 11,074,411	\$ 7,311,723
Accrued payroll and other expenses	1,859,081	1,573,799
Due to specific purpose funds	<u>7,772,769</u>	<u>5,841,580</u>
Total current liabilities	<u>20,706,261</u>	<u>14,727,102</u>

Fund balances (Exhibit C):**General Funds:**

Operating Funds	15,573,653	17,227,798
Board-designated funds	15,994,681	22,908,387
Invested in property, plant and equipment	<u>78,494,872</u>	<u>83,033,811</u>
Total fund balances	<u>110,063,206</u>	<u>123,169,996</u>

TOTAL UNRESTRICTED FUNDS **\$130,769,467** **\$137,897,098**

RESTRICTED FUNDS**SPECIFIC PURPOSE FUNDS****Restricted fund balances (Exhibit D):**

Fund for estimated liability for malpractice claims	\$ 9,544,917	\$ 7,631,641
Other restricted funds	<u>19,047,881</u>	<u>16,468,657</u>
TOTAL SPECIFIC PURPOSE FUNDS	<u>\$ 28,592,798</u>	<u>\$ 24,100,298</u>

PLANT REPLACEMENT AND EXPANSION FUNDS

Due to unrestricted funds		\$ 8,450,000
Fund balances (Exhibit D):		
Replacement fund	\$ 27,771,701	21,054,243
Building funds	<u>3,673,567</u>	<u>(6,044,244)</u>
TOTAL PLANT REPLACEMENT AND EXPANSION FUNDS ..	<u>\$ 31,445,268</u>	<u>\$ 23,459,999</u>

ENDOWMENT FUNDS

Endowment fund balances (Exhibit D)	\$ 75,388,379	\$71,389,423
TOTAL ENDOWMENT FUNDS	<u>\$ 75,388,379</u>	<u>\$71,389,423</u>

See Notes to Financial Statements.

EXHIBIT B

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK
STATEMENTS OF OPERATING REVENUES AND EXPENSES

For The Years Ended December 31, 1978 and 1977

	<u>1978</u>	<u>1977</u>
OPERATING REVENUES:		
Patient service revenues	\$160,403,729	\$161,794,572
Less allowances and uncollectible accounts:		
Contractual	13,088,294	27,971,971
Uncollectible accounts	6,300,000	9,102,542
Other (free care, etc.)	<u>9,022,325</u>	<u>9,230,273</u>
Total allowances and uncollectible accounts	<u>28,410,619</u>	<u>46,304,786</u>
Net patient service revenues	131,993,110	115,489,786
Transfers from specific purpose funds	3,409,698	3,311,057
Other services	<u>7,750,455</u>	<u>7,150,198</u>
Total operating revenues	<u>143,153,263</u>	<u>125,951,041</u>
OPERATING EXPENSES:		
Administrative and fiscal services:		
Administration	2,860,382	1,650,838
Assistant Secretary-Treasurer	3,948,487	3,632,212
Comptroller and data processing	5,482,244	5,073,109
Public interest	437,049	465,603
Non-professional services:		
Buildings and grounds	16,525,564	16,852,263
Food service	8,334,779	8,296,887
Personnel and protective	2,436,993	2,545,464
Other non-professional services	3,498,022	3,120,224
Professional services:		
Nursing	42,153,606	39,584,092
Professional staff, doctors' offices and research	16,513,046	15,363,637
Special services	28,014,694	27,863,025
Vanderbilt Clinic and other	13,786,818	12,580,326
Provision for depreciation	<u>7,058,716</u>	<u>6,938,005</u>
Total operating expenses	<u>151,050,400</u>	<u>143,965,685</u>
LOSS FROM OPERATIONS	<u><u>\$ 7,897,137</u></u>	<u><u>\$18,014,644</u></u>

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK
STATEMENTS OF REVENUES AND EXPENSES
AND CHANGES IN UNRESTRICTED FUND BALANCES

For the Years ended December 31, 1978 and 1977

	General Funds		Board - Designated Funds	In Property, Plant and Equipment	Total 1978	Total 1977
	Operating	Other				
OPERATING REVENUES:						
Net patient service revenues	\$131,993,110				\$131,993,110	\$115,489,786
Other services	7,750,455				7,750,455	7,150,198
Transfers from specific purpose funds	3,409,698				3,409,698	3,311,057
Total operating revenues	143,153,263				143,153,263	125,951,041
OPERATING EXPENSES:						
Salaries and related fringe benefits	102,885,968				102,885,968	96,715,264
Supplies and other expenses	41,105,716				41,105,716	40,312,416
Provision for depreciation	7,058,716				7,058,716	6,938,005
Total operating expenses	151,050,400				151,050,400	143,965,685
Loss From OPERATIONS	(7,897,137)				(7,897,137)	(18,014,644)
NON-OPERATING REVENUES:						
Investment income		\$3,424,710	\$ 708,013		4,132,723	3,896,612
Legacies		896,389			896,389	722,801
Contributions		686,284	550,000		1,236,284	684,672
Gain on sale of real estate		475,000			475,000	
Realized net gain (loss) on sales of investments		(75)	468,133		468,058	96,187
		5,482,308	1,726,146		7,208,454	5,400,272
Unrealized net (depreciation) of investments		(5,317)	(189,852)		(195,169)	(1,289,659)
Total non-operating revenues		5,476,991	1,536,294		7,013,285	4,110,613
REVENUES OVER (UNDER) EXPENSES Including unrealized net (depreciation) of investments	(7,897,137)	5,476,991	1,536,294		(883,852)	(13,904,031)
FUND BALANCE, JANUARY 1	17,227,798		22,908,387	\$83,033,811	123,169,996	139,498,276
TRANSFERS FROM (TO) RESTRICTED FUNDS FOR:						
Additions to property, plant and equipment				3,285,778	3,285,778	4,453,756
Funding of depreciation				(8,450,000)	(7,058,716)	(6,938,005)
Liquidation of loans to building funds					(8,450,000)	
Other purposes						60,000
INTRA-FUND TRANSFERS	13,301,708	(5,476,991)		(7,824,717)		
FUND BALANCE, DECEMBER 31	\$ 15,573,653		\$15,994,681	\$78,494,872	\$110,063,206	\$123,169,996

See Notes to Financial Statements.

EXHIBIT D

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK
STATEMENTS OF CHANGES IN RESTRICTED FUND BALANCES

For The Years Ended December 31, 1978 and 1977

	<u>1978</u>	<u>1977</u>
SPECIFIC PURPOSE FUNDS		
(For Research, Educational and Other Purposes)		
BALANCE, JANUARY 1	\$24,100,298	\$19,975,317
ADD:		
Legacies, contributions, grants, etc	5,948,996	5,333,245
Received from Columbia-Presbyterian Medical Center Fund, Inc. . .	53,381	95,295
Investment income	2,461,834	1,900,701
Funding of estimated liability for malpractice claims	1,595,833	3,687,500
Realized net gain on sales of investments	280,377	67,007
Transfers from (to) other funds—net	140,761	(55,147)
	<u>10,481,182</u>	<u>11,028,601</u>
Total	<u>34,581,480</u>	<u>31,003,918</u>
DEDUCT:		
Transfers to unrestricted funds for:		
Operating revenues	3,409,698	3,311,057
Payment of patients' accounts	667,278	698,108
Additions to property, plant and equipment	253,390	633,599
Unrealized net depreciation of investments	224,310	1,904,561
Other—net	1,434,006	356,295
	<u>5,988,682</u>	<u>6,903,620</u>
BALANCE, DECEMBER 31	<u>\$28,592,798</u>	<u>\$24,100,298</u>

PLANT REPLACEMENT AND EXPANSION FUNDS

REPLACEMENT FUND:		
Balance, January 1	\$21,054,243	\$17,203,369
ADD:		
Funding of depreciation	7,058,716	6,938,005
Investment income	1,286,409	878,250
Realized net gain on sales of investments	701,614	167,252
Unrealized net appreciation (depreciation) of investments	517,842	(1,332,983)
	<u>9,564,581</u>	<u>6,650,524</u>
Total	<u>30,618,824</u>	<u>23,853,893</u>
Deduct:		
Transfers to unrestricted funds for additions to property, plant and equipment	2,847,123	2,799,650
	<u>2,847,123</u>	<u>2,799,650</u>
Balance, December 31	<u>\$27,771,701</u>	<u>\$21,054,243</u>

EXHIBIT D

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK
STATEMENTS OF CHANGES IN RESTRICTED FUND BALANCES
 For The Years Ended December 31, 1978 and 1977

	<u>1978</u>	<u>1977</u>
PLANT REPLACEMENT AND EXPANSION FUNDS		
BUILDING FUNDS:		
Balance (deficit), January 1	\$(6,044,244)	\$(7,527,422)
Add:		
Legacies, contributions, grants and pledges	578,841	576,874
Received from Columbia-Presbyterian Medical Center Fund, Inc.	923,750	1,861,014
Investment income	142,563	95,452
Unrealized net appreciation of investments	146,075	13,125
Transfer from unrestricted funds in liquidation of loans	8,450,000	
	<u>10,241,229</u>	<u>2,546,465</u>
Total	<u>4,196,985</u>	<u>(4,980,957)</u>
Deduct:		
Transfers to unrestricted funds for additions to property, plant and equipment	185,265	1,020,507
Transfers to (from) other funds—net	143,493	(27,850)
Other—net	194,660	70,630
	<u>523,418</u>	<u>1,063,287</u>
Balance, December 31	<u>\$ 3,673,567</u>	<u>\$ (6,044,244)</u>

ENDOWMENT FUNDS

BALANCE, JANUARY 1	\$71,389,423	\$77,161,853
ADD:		
Legacies, contributions and grants	208,245	558,548
Realized net gain on sales of investments	2,191,387	568,315
Unrealized net appreciation (depreciation) of investments	1,596,592	(6,866,590)
Transfers from (to) other funds—net	2,732	(32,703)
	<u>3,998,956</u>	<u>(5,772,430)</u>
BALANCE, DECEMBER 31	<u>\$75,388,379</u>	<u>\$71,389,423</u>

See Notes to Financial Statements.

EXHIBIT E

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

STATEMENTS OF CHANGES IN FINANCIAL POSITION OF UNRESTRICTED FUNDS

For The Years Ended December 31, 1978 and 1977

	<u>1978</u>	<u>1977</u>
FUNDS PROVIDED:		
Transfers from restricted funds for:		
Additions to property, plant and equipment	\$ 3,285,778	\$4,453,756
Other		60,000
Decrease in due from restricted building funds	8,450,000	
Decrease in investments		7,051,735
Total funds provided	<u>11,735,778</u>	<u>11,565,491</u>
FUNDS APPLIED:		
Loss from operations (including funding of provision for depreciation)	7,897,137	18,014,644
Non-operating revenues—exclusive of unrealized net appreciation or depreciation of investments	(7,208,454)	(5,400,272)
Funds applied to operations	688,683	12,614,372
Unrealized net depreciation of investments	195,169	1,289,659
Increase in investments	1,536,294	
Additions to property, plant and equipment—net	2,519,777	4,453,756
Transfer to restricted building funds	8,450,000	
Total funds applied	<u>13,389,923</u>	<u>18,357,787</u>
DECREASE IN WORKING CAPITAL	(1,654,145)	(6,792,296)
WORKING CAPITAL, JANUARY 1	17,227,798	24,020,094
WORKING CAPITAL, DECEMBER 31	<u>\$15,573,653</u>	<u>\$17,227,798</u>
CHANGES IN COMPONENTS OF WORKING CAPITAL:		
Increase (decrease) in current assets:		
Cash	\$ (448,764)	\$ 332,625
Investments	(136,780)	1,025,286
Accounts receivable—net	3,499,451	(6,646,436)
Supplies and materials	300,001	(526,990)
Accrued interest and prepaid expenses	1,111,106	132,095
Decrease (increase) in current liabilities:		
Accounts payable	(3,762,688)	62,358
Accrued payroll and other expenses	(285,282)	(77,610)
Due to specific purpose funds	(1,931,189)	(1,093,624)
DECREASE IN WORKING CAPITAL	<u>\$(1,654,145)</u>	<u>\$(6,792,296)</u>

See Notes to Financial Statements.

EXHIBIT F

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK
NOTES TO FINANCIAL STATEMENTS,
 DECEMBER 31, 1978 AND 1977

1. The Presbyterian Hospital in the City of New York follows fund accounting principles as are customary for similar not-for-profit entities. Significant accounting policies employed in applying such principles are as follows:

(a) Classification of funds

Funds classified as unrestricted represent funds available for any hospital purpose as distinguished from funds restricted externally for certain operating, endowment, and plant replacement and expansion purposes. Board-designated funds represent unrestricted funds appropriated by the Board of Trustees for plant replacement and other purposes. Unrestricted gifts designated by the Board of Trustees for particular purposes are reported as revenues of board-designated funds.

(b) Investments and related income

Investments are carried at quoted market values.

Realized gains or losses, unrealized appreciation or depreciation of investments, and investment income are distributed to the general fund, to board-designated funds or restricted funds, as applicable.

(c) Property, plant and equipment

Property, plant and equipment are carried at cost less accumulated depreciation.

The straight line method of depreciation is utilized for all depreciable assets, except items of a movable nature which are depreciated on the double declining balance method.

The restricted replacement fund represents depreciation funded since January 1, 1970, as required by certain third-party payors, less capital acquisitions charged to the fund.

(d) Inventories

Inventories are carried principally at first-in, first-out cost.

(e) Pensions

The Hospital has a non-contributory retirement plan covering all non-union and certain union employees. The Hospital accrues and funds current service costs and the amortization of unfunded prior service cost over a period of 30 years.

(f) Funds held in trust by others

Non-discretionary trusts held by others from which the Hospital receives income are not carried in the accounts of the Hospital. The market values of such trusts were approximately \$3,200,000 at December 31, 1978 and 1977.

2. For the six-month period ended June 30, 1978 and for the year ended December 31, 1977 the Hospital was self-insured for malpractice claims of up to \$11,000,000 per occurrence/\$11,500,000 aggregate. Commercial insurance was purchased to obtain insurance coverage in excess of self-insured retention levels.

The Hospital charged to operations during the six-month period ended June 30, 1978 and during the year ended December 31, 1977 provisions of \$1,596,000 and \$3,687,500, respectively, representing actuarially determined estimates of liability relating to claims, both asserted and unasserted, resulting from incidents that occurred during such periods. The provisions have been funded and are included in specific purpose funds in the accompanying financial statements. In addition, the Hospital paid excess commercial coverage premiums of \$437,500 for the six-months ended June 30, 1978 and \$816,000 for the year ended December 31, 1977.

EXHIBIT F (Continued)

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

NOTES TO FINANCIAL STATEMENTS,

DECEMBER 31, 1978 AND 1977

Effective July 1, 1978, the Hospital obtained malpractice and general liability coverage through a commercial insurance company which was reinsured through a captive insurance company which was organized in cooperation with three other hospitals. The primary insurance coverage provides \$1,000,000 per occurrence/\$10,000,000 aggregate coverage to the hospitals and is financed by premiums paid by each of the participating institutions. An additional \$40,000,000 aggregate excess coverage was collectively purchased through other commercial insurance companies. For the six months ended December 31, 1978, the Hospital charged to operations malpractice and general liability insurance premiums of \$1,239,000, including \$389,000 for excess commercial coverage.

Prior to July 1, 1978, the Hospital's malpractice and general liability coverage was on an occurrence basis; subsequent to that date, insurance is provided on a claims-made basis. Claims based on occurrences prior to July 1, 1978 are insured under old conventional insurance coverage or self-insurance coverage. Should the claims-made policies not be renewed or replaced with equivalent insurance, claims based on occurrences during the term of the policies but reported subsequently will be uninsured.

3. The Hospital's contributions to its retirement plan amounted to \$1,602,200 and \$1,616,400 in 1978 and 1977, respectively. As of January 1, 1978, the date of the latest actuarial valuation of the retirement plan, the actuarially computed value of vested benefits exceeded the assets held in the Retirement Fund Trust and insurance company reserves by \$4,274,800. The plan's unfunded prior service cost at January 1, 1978 totaled \$11,152,041.
4. Property, plant and equipment consisted of the following at December 31:

	<u>1978</u>	<u>1977</u>
Land	\$ 2,938,822	\$ 2,938,822
Land improvements	652,013	650,013
Buildings	64,698,077	64,434,885
Fixed equipment	46,921,801	46,149,953
Movable equipment	<u>24,521,447</u>	<u>25,083,911</u>
Total	139,732,160	139,257,584
Less accumulated depreciation	<u>63,895,003</u>	<u>59,511,959</u>
Total	75,837,157	79,745,625
Construction in progress	<u>2,657,715</u>	<u>3,288,186</u>
Total	<u>\$78,494,872</u>	<u>\$83,033,811</u>

5. The Hospital leases data processing equipment under leases which expire over the next seven years. Total rental expense during 1978 and 1977 was \$317,000 and \$310,000, respectively.
6. The Hospital derived approximately \$100,000,000 of net patient service revenues during 1978 and \$90,000,000 during 1977 from services provided to patients covered by Medicare, Medicaid, and Blue Cross benefits. In addition, revenues for 1978 include approximately \$2,600,000 resulting from the resolution of various appeals of third-party payment rates for prior years.

AUDITORS' OPINION

THE PRESBYTERIAN HOSPITAL
IN THE CITY OF NEW YORK:

We have examined the following financial statements of The Presbyterian Hospital in the City of New York as of December 31, 1978 and 1977 and for the years then ended:

	<u>Exhibit</u>
Balance Sheets	A
Statements of Operating Revenues and Expenses	B
Statements of Revenues and Expenses and Changes in Unrestricted Fund Balances	C
Statements of Changes in Restricted Fund Balances	D
Statements of Changes in Financial Position of Unrestricted Funds	E
Notes to Financial Statements	F

Our examinations were made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, such financial statements present fairly the financial position of the Hospital at December 31, 1978 and 1977 and the results of its operations and the changes in financial position of its unrestricted funds for the years then ended, in conformity with generally accepted accounting principles applied on a consistent basis.

DELOITTE HASKINS & SELLS
Certified Public Accountants

February 12, 1979

REPORT OF THE AUDITING COMMITTEE

TO THE BOARD OF TRUSTEES OF THE PRESBYTERIAN HOSPITAL
IN THE CITY OF NEW YORK:

Pursuant to Article VII of the By-Laws of The Presbyterian Hospital in the City of New York, the undersigned Auditing Committee appointed by your Board has chosen, with your approval, the firm of Deloitte Haskins & Sells, as independent certified public accountants, to make an examination of the financial statements of The Presbyterian Hospital in the City of New York for 1978.

We submit herewith after due consideration by this Committee, an opinion of Deloitte Haskins & Sells dated February 12, 1979 relating to the Corporation's following financial statements and supplemental schedule as of December 31, 1978 and the year then ended:

	<u>Exhibit</u>
Financial Statements:	
Balance Sheets	A
Statements of Operating Revenues and Expenses	B
Statements of Revenues and Expenses and Changes in Unrestricted Fund Balances	C
Statements of Changes in Restricted Fund Balances	D
Statements of Changes in Financial Position of Unrestricted Funds	E
Notes to Financial Statements	F

Your Committee recommends that the opinion, financial statements and supplemental schedule be accepted and approved.

New York, N.Y.
March 14, 1979

HULBERT S. ALDRICH, Chairman
EDWARD H. AUCHINCLOSS
WILLIAM A. KLOPMAN

GEORGE S. DILLON
ROBERT WINTHROP
Auditing Committee

GROUP RETIREMENT PLAN ESTABLISHED BY THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

The retirement benefits provided by the Hospital under its Group Retirement Plan are partly provided by a Trust Fund established with the Morgan Guaranty Trust Company of New York and partly by a contract with Travelers Insurance Company. The amount set aside for retirement benefit purposes, which are not part of the assets of the Hospital, aggregated \$27,893,914 at December 31, 1978. The total pension expense under the Plan for 1978 was \$1,602,200. Pension expense for 1977 was \$1,616,400. The Hospital's policy is to fund pension cost accrued. The actuarially computed value of vested benefits as of January 1, 1978, the date of the last actuarial valuation of the Plan, was \$31,076,400. In accordance with the Hospital's undertaking under the Group Retirement Plan, the amounts set aside are sufficient to provide all retirement benefits to which employees now retired and employees now eligible to retire at their own request are or would upon retirement be entitled to under the Plan. In addition, they include provisions for that portion of future retirement benefits to employees not now eligible for retirement at their own request, which has been funded through December 31, 1978 under the systematic program followed by the Hospital in financing such benefits.

Following is the Trustee's report for the year ended December 31, 1978 on the Retirement Fund Trust established by the Hospital:

Assets in Fund—January 1, 1978	\$22,527,231
Payments to Fund	1,602,200
Net Income from Investments including Net Profit on Investments Disposed of	921,658
	<u>25,051,089</u>
Disbursements for Retirement Benefits	1,409,825
Assets in Fund—December 31, 1978	<u>\$23,641,264</u>
Consisting of:	Book Value*
Industrial, Railroad, Public Utilities and Miscellaneous Bonds	\$ 2,359,766
Common Stocks—Equities	12,252,871
Commingled Pension Trust Funds:	
Bonds—Market Long Term	664,373
Bonds—Private Placements	67,755
FIDP Corp. Med. Term	874,722
FIDP Mortgage—Real Property	1,121,265
Intermediate Capitalization	2,022,468
Money Market—Intermediate	203,539
Special Situation Investments—Convertibles	1,206,321
Special Situation Investments—Equities	1,321,985
Special Situation Investments—International Bonds	324,504
Special Situation Investments—International Equities	726,080
Special Situation Investments—Real Estate	494,939
Cash	676
	<u>\$23,641,264</u>

*The cash and approximate market value of securities held as of December 31, 1978 totaled \$24,655,970.

MORGAN GUARANTY TRUST COMPANY OF NEW YORK,
Trustee

BY ARNOLD E. SIGLER
Vice President

Following is a summary of the Retirement Fund Trust and the Travelers Insurance Company reserves at December 31, 1978:

Retirement Fund Trust—Morgan Guaranty Trust Company of New York, Trustee	\$23,641,264
Retirement Plan reserves held by Travelers Insurance Company	<u>4,252,650</u>
	<u>\$27,893,914</u>

IN-PATIENT STATISTICS

Year 1978

	<u>Admissions</u>	<u>Patient Days</u>	<u>Average Length of Stay</u>
Dermatology	359	6,011	16.70
Medicine	7,827	85,140	11.19
Neurological Surgery	1,089	18,333	15.52
Neurology	2,361	42,856	19.46
Obstetrics and Gynecology	7,315	34,308	4.71
Ophthalmology	2,897	13,344	4.61
Orthopedic Surgery	4,186	49,470	11.89
Otolaryngology	1,321	6,579	4.96
Pediatrics	5,971	46,791	7.50
Psychiatry	159	4,659	25.88
Rehabilitation Medicine	41	5,298	40.44
Surgery	6,032	68,276	10.85
Urology	2,457	19,668	7.92
Radiotherapy	<u>2</u>	<u>14</u>	<u>7.00</u>
Total	<u>42,017</u>	<u>400,747</u>	<u>9.46</u>

	<u>Bed Complement(*)</u>	<u>Admissions</u>	<u>Patient Days</u>	<u>Average Length of Stay</u>
Private	287	9,298	87,971	9.25
Semi-Private	673	21,304	206,097	9.48
Ward	331	11,415	106,679	9.63
Total	<u>1,291</u>	<u>42,017</u>	<u>400,747</u>	<u>9.46</u>
Nursery	<u>48</u>	<u>2,960</u>	<u>12,441</u>	<u>4.57</u>

(*) As of December 31.

AMBULATORY STATISTICS

			1978	1977
VANDERBILT CLINIC:				
Summary of Patients Treated:				
Number of Patients Treated			105,597	102,760
Number of Visits:				
Medicaid			136,269	165,266
Medicare			69,491	70,580
Blue Cross and Blue Shield			5,704	6,974
Charges and miscellaneous agencies			65,714	39,396
Full Pay			6,281	6,402
Part Pay			52,166	50,512
Free, transfers and follow ups			4,910	5,127
Personnel and dependents			17,959	15,069
Total			358,494	359,326
			1978	1977
VANDERBILT CLINIC AND DOCTORS' OFFICES:				
Number of Visits:	<i>Doctors' Offices</i>	<i>Clinic</i>	<i>Total Visits</i>	<i>Total Visits</i>
Dentistry	2,802	—	2,802	2,947
Dermatology	14,640	13,668	28,308	25,822
Emergency — Adults	—	67,689	67,689	67,926
Emergency — Pediatrics	—	38,439	38,439	31,526
Group Clinic	—	26,508	26,508	26,592
Medicine	29,746	23,835	53,581	55,583
Neurology	14,169	12,076	26,245	26,851
Obstetrics and Gynecology	35,730	32,809	68,539	68,354
Ophthalmology	44,915	23,637	68,552	72,640
Orthopedic	28,248	24,946	53,194	53,451
Otolaryngology	16,566	12,193	28,759	30,501
Pediatrics	13,434	22,310	35,744	38,609
Physical Medicine and Rehabilitation ..	—	11,088	11,088	10,156
Psychiatry	12,004	15,121	27,125	21,805
Radiotherapy	—	4,378	4,378	5,338
Surgery	28,816	22,673	51,489	51,600
Urology	9,226	7,124	16,350	16,537
Funded Programs	2,303	—	2,303	2,944
Total	252,599	358,494	611,093	609,182

PERSONNEL STATISTICS

	<i>On Duty December 31</i>	
	1978	1977
Administration	24	23
Assistant Secretary-Treasurer	180	133
Comptroller	232	236
Public Interest	26	29
Non-professional services:		
Buildings and grounds	623	658
Food service	292	312
Personnel and protective	131	142
Other non-professional services	113	211
Professional services:		
Nursing	2,157	2,161
Professional staff, doctors' offices and research	625	595
Special services	876	904
Vanderbilt Clinic and other	474	454
Total	5,753	5,858
Students:		
Department of Nursing, Faculty of Medicine, Columbia University	306	468
The Edna McConnell Clark School of Nursing:		
Practical Nursing	45	58
Associate Degree Nursing	37	38
Presbyterian Hospital School of:		
Radiologic Technology	15	16
Operating Room Technology	9	7
Orthoptic and Ophthalmic Assistants	2	4
Electroencephalographic Technology	—	9
Total	414	600

BOARD OF WOMEN MANAGERS OF THE BABIES HOSPITAL

(Including Cribside Social Service Committee)

SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

For the Years Ended December 31, 1978 and 1977

	1978	1977
Balance, January 1	\$12,397.10	\$17,496.59
Receipts:		
Membership Dues.....	1,575.00	1,435.00
Donations	600.00	930.00
United Hospital Fund:		
Direct Benefit	5,928.00	6,927.00
Free Care Distribution	2,580.00	2,347.00
Greater New York Fund	17,680.00	12,316.00
Investment Income	1,308.28	1,150.46
Transfer From Emergency Nursing Fund	4,000.00	
Total Receipts	33,671.28	25,105.46
Disbursements:		
Care of Ward and Clinic Patients	5,928.00	6,927.00
Emergency Nursing Fund		4,000.00
Pediatric Psychiatric Clinic	1,500.00	1,500.00
Volunteers	500.00	500.00
Recreational Therapy	4,500.00	4,500.00
Social Service Expenditures	15,011.64	12,119.01
Miscellaneous	564.90	658.94
Total Disbursements	28,004.54	30,204.95
Balance, December 31	\$18,063.84	\$12,397.10
EMERGENCY NURSING FUND—BABIES HOSPITAL		
Balance, January 1	\$17,714.06	\$ 9,234.71
Receipts:		
Board of Women Managers of The Babies Hospital		4,000.00
Donations	550.00	4,530.00
Total Receipts	550.00	8,530.00
Disbursements:		
Transfer to the Discretionary Fund (Beaupre Charitable Trust)	4,000.00	
Transfer to the Auxiliary General Account	4,000.00	
Miscellaneous		50.65
Total Disbursements	8,000.00	50.65
Balance, December 31	\$10,264.06	\$17,714.06
DISCRETIONARY FUND OF THE BABIES HOSPITAL BOARD OF WOMEN MANAGERS		
Balance, January 1	\$21,704.45	\$25,905.36
Receipts:		
Theater Benefit	25,691.00	1,780.00
Donations	2,000.00	2,861.21
Transfer from Lecture Fund	5,320.12	2,654.00
Transfer From Emergency Fund (Beaupre Charitable Trust)	4,000.00	
Total Receipts	37,011.12	7,295.21
Disbursements:		
Benefit Expenses	10,276.96	1,720.00
Salary—Recreational Therapist	9,819.04	9,776.12
Five Window Air Conditioning Units	3,566.00	
Total Disbursements	23,662.00	11,496.12
Balance, December 31	\$35,053.57	\$21,704.45

M. FRANCES MOFFAT, *Treasurer*

NEUROLOGICAL INSTITUTE AUXILIARY

SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

For the Years Ended December 31, 1978 and 1977

	<u>1978</u>	<u>1977</u>
Balance, January 1	\$28,930.29	\$32,785.37
Receipts:		
Donations and Membership Dues	4,080.00	2,815.00
United Hospital Fund:		
Direct Benefit	15,302.00	14,028.00
Free Care Distribution	2,314.00	2,106.00
Greater New York Fund	15,864.00	11,050.00
Investment Income	221.89	195.12
Benefit		13,518.00
Everybody's Thrift Shop	17,501.52	10,182.53
Recreational Therapy Fund	5,790.07	5,684.99
Total Receipts	<u>61,073.48</u>	<u>59,579.64</u>
Disbursements:		
Care of Ward and Clinic Patients	10,302.00	9,028.00
Neurological Institute Library	5,000.00	5,000.00
Library	8,000.00	8,000.00
Volunteer Service	1,900.00	1,900.00
Recreational Therapist Salary (Pediatric Neurology Clinic)	864.00	1,048.89
Recreational Therapist Salary (Neurological Institute)	5,790.07	5,684.99
Nurse Specialist—Neurology Clinic	5,000.00	5,000.00
Purchase of Electric Beds	3,493.50	
Benefit—Explorers Club		3,463.01
N.I.—Overbed Lights		19,748.30
Shopping Cart		1,547.09
Social Services Expenditures:		
Staff Development	300.00	273.00
Summer Camps	300.00	255.25
Transportation	447.20	397.65
Medical Appliances and Maintenance	282.00	445.38
Other	103.00	80.00
Refurbishing N.I. X-ray Department	7,445.05	
Partition in N.I. Basement	310.00	
Awards and Citations	520.21	
Everybody's Thrift Shop	627.40	902.06
Miscellaneous	<u>1,151.99</u>	<u>661.10</u>
Total Disbursements	<u>51,836.42</u>	<u>63,434.72</u>
Balance, December 31	<u>\$38,167.35</u>	<u>\$28,930.29</u>

WOMEN'S AUXILIARY OF THE NEW YORK ORTHOPEDIC HOSPITAL
SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

For the Years Ended December 31, 1978 and 1977

	<u>1978</u>	<u>1977</u>
Balance, January 1	\$13,661.66	\$21,687.64
Receipts:		
Donations	13,922.43	3,954.80
United Hospital Fund:		
Direct Benefit	15,609.00	15,340.00
Free Care Distribution	1,096.00	997.00
Greater New York Fund	7,511.00	5,232.00
Investment Income	2,627.53	2,310.56
Total Receipts	<u>40,765.96</u>	<u>27,834.36</u>
Disbursements:		
Care of Ward and Clinic Patients	15,609.00	15,340.00
Library	4,179.81	3,640.44
Volunteer Service	1,100.00	1,100.00
Recreational Therapy Expenses:		
Salary	8,334.88	13,231.43
Other Miscellaneous	312.49	756.05
Renovation of 5th Floor Babies Hospital: ..		
Lounge Decorations		1,417.42
Miscellaneous	<u>340.17</u>	<u>375.00</u>
Total Disbursements	<u>29,876.35</u>	<u>35,860.34</u>
Balance, December 31	<u>\$24,551.27</u>	<u>\$13,661.66</u>

ELIOT B. HIGHET, *Treasurer*

PRESBYTERIAN HOSPITAL AUXILIARY
SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

For the Years Ended December 31, 1978 and 1977

	<u>1978</u>	<u>1977</u>
Balance, January 1	\$23,931.46	\$35,907.43
Receipts:		
Membership Dues	1,490.00	1,720.00
Donations	33.00	100.00
United Hospital Fund:		
Direct Benefit	11,319.00	17,253.00
Free Care Distribution	1,455.00	1,323.00
Greater New York Fund	9,970.00	6,946.00
Auxiliary Benefit	18,698.00	13,813.50
Stuyvesant Square Thrift Shop	26,229.06	25,550.83
Shopping Cart	12,118.58	14,767.00
Total Receipts	<u>81,312.64</u>	<u>81,473.33</u>
Disbursements:		
Care of Ward and Clinic Patients	11,319.00	17,253.00
Parking for Volunteers	828.00	787.50
Library	10,050.00	10,050.00
Volunteer Service	7,200.00	7,200.00
Recreational Therapist Salary	15,575.85	14,175.08
Student Nurse Scholarship Fund	1,000.00	1,000.00
Anna Ball Kneeland Memorial Fund for Staff Development in Social Service	65.00	
Emily Webster Fund	500.00	500.00
Blood Bank Education Fund	500.00	500.00
Audio-Visual Viewers and Cassettes for The		
Eye Institute	2,796.00	
Auxiliary Benefit	6,759.97	4,910.24
Shopping Cart:		
Miscellaneous Sundries	8,429.85	12,066.90
Center for Population and Family Health Project		23,688.00
Miscellaneous	1,880.44	1,318.58
Total Disbursements	<u>66,904.11</u>	<u>93,449.30</u>
Balance, December 31	<u>\$38,339.99</u>	<u>\$23,931.46</u>

ANNA BALL KNEELAND MEMORIAL FUND
FOR STAFF DEVELOPMENT IN SOCIAL SERVICE

	<u>1978</u>	<u>1977</u>
Balance, January 1	\$ 368.54	\$ 759.78
Receipts:		
Presbyterian Hospital Auxiliary	65.00	
Total Receipts	<u>65.00</u>	
Disbursements:		
Symposium	341.85	304.84
Dr. Florence Liben		86.40
Total Disbursements	<u>341.85</u>	<u>391.24</u>
Balance, December 31	<u>\$ 91.69</u>	<u>\$ 368.54</u>

GRACE F. ELLSWORTH, *Treasurer*

COLUMBIA-PRESBYTERIAN MEDICAL CENTER FUND, INC.

BALANCE SHEETS

December 31, 1978 and 1977

	1978	1977
UNRESTRICTED FUND		
ASSETS:		
Cash	\$ 85,512	\$ 92,852
Investments (at quoted market values which approximate cost)	1,811,077	1,813,338
TOTAL ASSETS	<u>\$1,896,589</u>	<u>\$1,906,190</u>
LIABILITIES AND FUND BALANCE:		
Accounts payable and accrued expenses	\$ 54,149	\$ 113,565
Fund balance	1,842,440	1,792,625
TOTAL LIABILITIES AND FUND BALANCE	<u>\$1,896,589</u>	<u>\$1,906,190</u>
RESTRICTED EXPENDABLE FUNDS		
ASSETS:		
Cash	\$ 95,881	192,900
Investments (at quoted market values which approximate cost)	1,950,000	1,071,099
Interest in oil and gas leaseholds (Note 4)	56,280	67,622
Interest and dividends receivable	120,573	82,383
TOTAL ASSETS	<u>\$2,222,734</u>	<u>\$1,414,004</u>
FUND BALANCES	<u>\$2,222,734</u>	<u>\$1,414,004</u>
ENDOWMENT FUNDS		
ASSETS:		
Cash	\$ 219,873	\$ 166,668
Investments—at quoted market values (cost—1978, \$7,646,572; 1977, \$7,076,368)	7,471,017	6,696,775
TOTAL ASSETS	<u>\$7,690,890</u>	<u>\$6,863,443</u>
FUND BALANCES	<u>\$7,690,890</u>	<u>\$6,863,443</u>

See Notes to Financial Statements.

COLUMBIA-PRESBYTERIAN MEDICAL CENTER FUND, INC.
**STATEMENTS OF REVENUES, EXPENDITURES AND DISTRIBUTIONS
 AND CHANGES IN UNRESTRICTED FUND BALANCE**

For the Years Ended December 31, 1978 and 1977

	<u>1978</u>	<u>1977</u>
REVENUES:		
Contributions and legacies	\$1,103,837	\$1,662,478
Investment income	<u>143,949</u>	<u>71,170</u>
Total revenues	<u>1,247,786</u>	<u>1,733,648</u>
 EXPENDITURES AND DISTRIBUTIONS:		
Fund raising expenses for Columbia-Presbyterian Medical Center Development Program:		
Professional fund raisers fees	141,372	186,815
Staff salaries and related benefits	373,745	321,783
Other expenses	<u>129,295</u>	<u>177,717</u>
Total fund raising expenditures	<u>644,412</u>	<u>686,315</u>
 Distribution of funds for construction purposes:		
Columbia University	26,150	154,500
Presbyterian Hospital	<u>527,409</u>	<u>359,702</u>
Total distributions	<u>553,559</u>	<u>514,202</u>
Total expenditures and distributions	<u>1,197,971</u>	<u>1,200,517</u>
 REVENUES OVER EXPENDITURES AND DISTRIBUTIONS	49,815	533,131
FUND BALANCE, JANUARY 1	<u>1,792,625</u>	<u>1,259,494</u>
 FUND BALANCE, DECEMBER 31	<u><u>\$1,842,440</u></u>	<u><u>\$1,792,625</u></u>

See Notes to Financial Statements.

COLUMBIA-PRESBYTERIAN MEDICAL CENTER FUND, INC.
STATEMENTS OF CHANGES IN RESTRICTED FUND BALANCES

For the Years Ended December 31, 1978 and 1977

RESTRICTED EXPENDABLE FUNDS	<u>1978</u>	<u>1977</u>
BALANCE, JANUARY 1	\$1,414,004	\$2,032,658
ADD:		
Contributions and legacies	2,343,916	1,604,466
Investment income	482,172	345,870
	<u>2,826,088</u>	<u>1,950,336</u>
Total	<u>4,240,092</u>	<u>3,982,994</u>
DEDUCT:		
Grants to:		
Columbia University:		
For construction purposes	1,200,235	733,707
For faculty salaries	107,931	91,832
For professorship	25,062	28,800
For other purposes	97,733	99,786
Presbyterian Hospital:		
For construction purposes	501,213	1,501,312
For faculty salaries	22,106	18,809
For other purposes	11,858	76,486
Transfers to endowment funds	<u>51,220</u>	<u>18,258</u>
	<u>2,017,358</u>	<u>2,568,990</u>
BALANCE, DECEMBER 31	<u>\$2,222,734</u>	<u>\$1,414,004</u>

ENDOWMENT FUNDS

BALANCE, JANUARY 1	\$6,863,443	\$6,271,085
Contributions	580,414	1,064,916
Realized net gain (Loss) on sales of investments	(8,225)	67,294
Unrealized net appreciation (depreciation) of investments	204,038	(558,110)
Transfers from restricted expendable funds	<u>51,220</u>	<u>18,258</u>
	<u>827,447</u>	<u>592,358</u>
BALANCE, DECEMBER 31	<u>\$7,690,890</u>	<u>\$6,863,443</u>

See Notes to Financial Statements.

COLUMBIA-PRESBYTERIAN MEDICAL CENTER FUND, INC.

**NOTES TO FINANCIAL STATEMENTS,
DECEMBER 31, 1978 and 1977**

1. The Fund follows fund accounting principles as are customary for not-for-profit entities.
2. The Columbia-Presbyterian Medical Center Fund, Inc. was established to raise funds to be used for the joint educational, scientific and charitable purposes now carried on by the Presbyterian Hospital in the City of New York and Columbia University in the City of New York through the Columbia-Presbyterian Medical Center. Funds so raised are distributed to the Hospital and the University as follows: restricted funds are distributed as requisitioned by either the Hospital or the University for the purposes specified by the donor; unrestricted funds in excess of those required for the operation of the Fund are distributed equally to the Hospital and the University except that contributions received from Trustees of the Hospital or the University are distributed to construction projects of the Trustees' institutions.
3. The Fund's financial statements do not include amounts contributed directly to the Presbyterian Hospital or Columbia University for the development of the Columbia-Presbyterian Medical Center. Expenses are incurred by the Hospital and the University in connection with the operation of the Fund but such expenses are not billed to the Fund.
4. An interest in oil and gas leaseholds is carried at the net present value, based on an interest rate of 8%, of future income as estimated by an independent engineering firm.

AUDITORS' OPINION

COLUMBIA-PRESBYTERIAN MEDICAL CENTER FUND, INC.:

We have examined the balance sheets of Columbia-Presbyterian Medical Center Fund, Inc. as of December 31, 1978 and 1977 and the related statements of revenues, expenditures and distributions and changes in unrestricted fund balance and of changes in restricted fund balances for the years then ended. Our examinations were made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, such financial statements present fairly the financial position of the Fund at December 31, 1978 and 1977 and the results of its operations and changes in its fund balances for the years then ended, in conformity with generally accepted accounting principles applied on a consistent basis.

April 6, 1979

Deloitte Haskins & Sells
Certified Public Accountants

Endowed Beds and Rooms

1) A gift of \$10,000, specified for an endowed bed, shall entitle the donor to nominate patients to use and occupy a bed in the common wards of the Hospital, such use to be limited to the value of income earned and accumulated by that gift. Income shall accumulate annually. At the end of each calendar year, any income not utilized shall be used for free care for needy patients of the Hospital.

It is the policy of the Hospital that any insurance or other third-party medical benefits of patients nominated to use and occupy endowed beds be applied to charges incurred prior to the utilization of endowed bed benefits.

The donor may at the time of making the gift appoint to another in his stead such right to nominate, provided the appointee is acceptable to the Hospital.

Such right to nominate may be exercised only:

(a) During the life of the person having the right to nominate, if such right is an individual.

(b) For a period of fifteen years, if such right is in a Corporation, Society or Association.

After the right to nominate expires, the entire fund, principal and income, shall be considered part of the unrestricted fund of the Hospital.

2) Endowed Bed privileges are subject to all rules and regulations governing the admission, treatment and discharge of patients.

3) The Board of Trustees may in their discretion under special circumstances accept gifts for the endowment of beds on such other terms and conditions as they may deem best calculated to promote the

objectives for which the Hospital was established and is maintained.

4) Periodic gifts may be made until endowment of a bed is completed, at which time the right to nominate shall commence.

Memorial Endowed Beds for Research Purposes

A gift of \$10,000 shall entitle the donor to establish a memorial endowed bed for research purposes in a ward of the Hospital.

The President of the Medical Board shall, subject to the approval of the President of the Hospital, have the privilege of nominating patients to use and occupy a Memorial Endowed Bed for Research Purposes, for a period of fifteen years, such use to be limited to the value of income earned and accumulated by the gift. Income from the gift shall accumulate until utilized, during the period in which nominating rights are in effect.

After the right to nominate expires, the entire fund, principal and income, shall be considered part of the unrestricted fund of the Hospital.

Endowed Rooms

The Board of Trustees may in their discretion under special circumstances accept gifts for the endowment of rooms on such terms and conditions as they may deem best calculated to promote the objectives for which the Hospital was established and is maintained.

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Gifts and Bequests

The activities of the Medical Center are supported to a substantial extent by the income from bequests of friends who desire to insure the continuation of their help to the sick.

Depending upon the wishes of the donor or the objects and purposes of the gift, gifts or bequests may be made to any one of the following:

Columbia-Presbyterian Medical Center Fund, Inc.

The Trustees of Columbia University in the City of New York for the use of its College of Physicians and Surgeons.

The Presbyterian Hospital in the City of New York.

Bequests may be made in the following form:

Form of Bequest *I give and bequeath to _____ the sum*
of _____ dollars (\$ _____) to be applied
to the use and benefit of said corporation, under the direction of the Trustees thereof.

In case it is desired to specify the particular use to which the bequest is to be put, such use may be specified in place of the words "*to be applied to the use and benefit of the said corporation, under the direction of the Trustees thereof*" in the form of bequest given above.

In case it is desired to make the bequest as a memorial, "*in memory of _____*" may be added to the form of bequest.

The Presbyterian Hospital in the City of New York, by reason of the consolidation of its constituent hospitals at the Medical Center, will receive gifts made to The Presbyterian Hospital in the City of New York, to the Babies Hospital of the City of New York, to Neurological Institute of New York and to New York Orthopaedic Dispensary and Hospital. It is, therefore, not necessary to change the provision of any will naming any of the foregoing constituent hospitals as a beneficiary. Of course, a gift or bequest to The Presbyterian Hospital in the City of New York may specify that it is to be used for the benefit of any one of the foregoing constituent hospitals or for any other purpose.

Columbia University's College of Physicians and Surgeons, including its School of Nursing and School of Public Health, encompasses a variety of teaching and research programs. A gift or bequest to the College of Physicians and Surgeons may specify that it is to be applied to any one of the many programs mentioned in the body of the report or for general educational and research purposes of the College of Physicians and Surgeons.



The Presbyterian Hospital

in the City of New York

622 W 168th St., N.Y., N.Y. 10032



College of Physicians and Surgeons

Columbia University in the City of New York

630 W 168th St., N.Y., N.Y. 10032



Columbia-Presbyterian Medical Center

COMBINED ANNUAL REPORT 1979

Chief of Physicians and Surgeons
John H. Lawrence
Columbia University

President of the Board
John H. Lawrence



7
TWENTY-FIRST COMBINED ANNUAL REPORT

of the

COLUMBIA-PRESBYTERIAN MEDICAL CENTER

622-630 West 168th Street, New York, N.Y. 10032



College of Physicians and Surgeons • Columbia University
in the City of New York

The Presbyterian Hospital in the City of New York
and

School of Dental and Oral Surgery • Columbia University
in the City of New York

December 31, 1979

This report is dedicated to the most important person in the Medical Center, the patient; to those entrusted with his care and those who through their training are preparing to care for him.

The Medical Center comprises modern buildings and facilities for the carrying out of patient care, closely integrated with teaching and research. But it is the 10,000 people who serve and study within the Hospital and College, who give life and breath to this concept.

“Those who serve” include every worker—professional, non-professional, student and volunteer. These are the people who provide the best in patient care today and contribute toward advancement in health and medical science tomorrow.

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Origin and Functions of the Columbia-Presbyterian Medical Center

The Medical Center, comprising a group of long established hospitals of high standing and the College of Physicians and Surgeons of Columbia University, furnishes an integrated program to provide the highest quality of medical care for the sick and injured, to advance knowledge about the cause, prevention and treatment of disease and disability, and to train men and women in the professions of medicine, dentistry, nursing, public health, and allied fields. Through the affiliation between the Hospitals and the University the members of the staffs of the Hospitals are nominated by Columbia University, and teaching and research are conducted in all the Hospitals.

College of Physicians and Surgeons

Columbia University began as King's College, which was founded in 1754 by royal grant of George II, King of England, "for the Instruction of Youth in the Learned Languages, and the Liberal Arts and Sciences." The Revolutionary War interrupted its program, but in 1784, it was reopened as Columbia College. In 1912, the title was changed to Columbia University in the City of New York.

King's College organized a medical faculty in 1767 and was the first institution in the North American Colonies to confer the degree of Doctor of Medicine in course. The first individuals to graduate in medicine from the College were Robert Tucker and Samuel Kissam, who received the degree of Bachelor of Medicine in May, 1769, and that of Doctor of Medicine in May, 1770, and May, 1771, respectively. Instruction in medicine was given until the War of the Revolution. In 1784, instruction was resumed in the academic department. Eight years later, the medical faculty was reestablished. In 1814, the medical faculty of Columbia College was merged with the College of Physicians and Surgeons, which had obtained an independent charter in 1807. In 1860, by agreement between the Trustees of the two institutions, the College of Physicians and Surgeons became the Medical Department of Columbia College; from that time on, the diplomas of the graduates were signed by the President of Columbia College, as well as by the President of the College of Physicians and Surgeons. The connection was only a nominal one, however, until 1891, when the College was incorporated as an integral part of the University. Since September, 1917, women have been admitted to the School on the same basis as men. In 1928, the

College of Physicians and Surgeons moved from its site on West Fifty-Ninth Street to the Medical Center at 168th Street between Broadway and Fort Washington Avenue. In addition to its primary affiliation with Presbyterian Hospital, the College also has major or partial affiliations with Harlem, and St. Luke's-Roosevelt, in New York City; Mary Imogene Bassett Hospital in Cooperstown, N.Y.; Helen Hayes Hospital in West Haverstraw, N.Y., and Overlook Hospital in Summit, N.J.

The School of Public Health

The School of Public Health and Administrative Medicine is an integral part of the medical faculty of Columbia University. The staff provides both graduate and undergraduate instruction and research opportunities in preventive and administrative medicine and in community organization for health services of all types.

The School of Dental and Oral Surgery

In September, 1916, students in dentistry were admitted to courses in Columbia University at the College of Physicians and Surgeons. On March 15, 1917, the Trustees of Columbia University established a School of Dentistry as of September 27, 1916, so that the conduct of courses from that date, as forming part of the work of the School, might be officially recognized.

The School provides undergraduate instruction in dentistry and dental hygiene. Postgraduate courses in the specialties of dentistry and a master's degree in dental hygiene are offered. Clinics, open to the public, are conducted in all areas of dentistry and the Hospital Dental Service is staffed and maintained by the School.

The School of Nursing

In 1935 the College of Physicians and Surgeons of Columbia University assumed responsibility for the educational programs of the School of Nursing of the Presbyterian Hospital, and in 1937 the University established the Department of Nursing of the Faculty of Medicine. In 1974 the Department became known as the School of Nursing of the Faculty of Medicine of Columbia University.

The School of Nursing prepares men and women to practice as individuals and with members of other

disciplines. The baccalaureate program enrolls students who wish to begin the study of nursing as well as those already registered nurses who wish to deepen and broaden their knowledge through general college work and nursing on the senior college level. Several education courses in other divisions of the University (Barnard and Teachers College) are open to graduate and undergraduate students. Graduate programs afford nurses the opportunity to increase their knowledge and skills with practice in special health care fields.

William Black Medical Research Building

The 20-story William Black Medical Research Building at 168th Street and Fort Washington Avenue is used exclusively for research by P&S faculty. The building, dedicated January 3, 1966, was named for William Black, founder and Chairman of the Board of the Chock Full o' Nuts Corp.

Julius and Armand Hammer

Health Sciences Center—Augustus Long Library

The Health Sciences Center, on the northwest corner of Fort Washington Avenue and 168th Street, was dedicated on October 6, 1976, and in 1977 was named in honor of P&S Alumni Armand Hammer and his father, also an alumnus. The 20-story tower provides facilities for the Augustus Long Library, the Jeremiah Milbank and Margaret Milbank Bogert Teaching Center, the March of Dimes Virginia Apgar Center for Genetics, Nutrition and Human Development, an Audio Visual and multimedia production and distribution center and nine floors of research laboratories for the Cancer Center/Institute of Cancer Research and the Departments of Biochemistry, Microbiology, and Human Genetics and Development.

The Institute of Human Nutrition

The Institute of Human Nutrition was established in 1958 following the endowment of the R.R. Williams Professorship of Nutrition from the Williams-Waterman Fund. The principal objective of the Institute is to provide the specialized training necessary to combat and prevent the effects of malnutrition. Emphasis is placed on the training of medical students, physicians and biochemists. Degrees offered are the Master of Science in nutrition through the Faculty of Medicine and the Ph.D. in nutrition through the Graduate School of Arts and Sciences. The teaching and research program is organized around three divisions: the Division of Growth and Development, the Division of Nutrition and Metabolism, and the Division of Community Nutrition. Teaching and research facilities are located in the

William Black Medical Research Building and at St. Luke's Hospital Center. In addition, the Institute maintains national and international ties with numerous medical schools and research centers.

International Institute for the Study of Human Reproduction

The International Institute for the Study of Human Reproduction was founded in 1965 with a grant from the Ford Foundation, later supplemented by one from the Rockefeller Foundation. Its primary purpose is to do research in the fields of biology, clinical investigation, and the social sciences relevant to the solution of the world population problem. A parallel objective is to study the many complications of the reproductive process affecting human welfare, such as infertility, endocrine disorders, out-of-wedlock pregnancy, marital and other social problems. The Institute incorporates two major centers: The Center for Reproductive Sciences and the Center for Population and Family Health.

Cancer Center/Institute of Cancer Research

The Cancer Research Center was established in 1973. In 1977 it was designated the Cancer Center/Institute of Cancer Research. The Center coordinates, integrates, and facilitates cancer research, education, and patient care in the Health Sciences Faculties of Columbia University and its affiliated hospitals in New York City—Presbyterian, St. Luke's—Roosevelt, and Harlem. The Cancer Center was organized to effect the efficient and cooperative use of all Center resources, maximize the dissemination of information among Center personnel, facilitate the rapid translation of cancer research findings into programs for improving capabilities for the prevention of cancer and the care of patients with cancer, and carry on outreach and control programs in cancer. The Center is charged with the responsibility for research, education, and cancer-patient care by all health professionals.

The Institute of Cancer Research of Columbia University, College of Physicians and Surgeons, was established in 1909 with funds bequeathed to the University by George Crocker. It moved from its original quarters on 116th Street to the campus of the Columbia-Presbyterian Medical Center in 1938. The Institute and Center are fully integrated. The Institute, following the closing of the Francis Delafield Hospital, moved into the Health Sciences Center Cancer Research Laboratories.

The Center is composed of five operational divisions: Basic Science Research, Clinical Research and Patient Care, Education, Outreach and Control Programs, and Administration and Core Facilities.

The Center for Community Health Systems

The Center for Community Health Systems is an interdisciplinary and interdepartmental activity of the Faculty of Medicine whose purpose is to enlist the substantial and varied resources of the University and its affiliated hospitals in a systematic attack on the problems of the organization and delivery of health care.

In 1970 the Faculty of Medicine decided that it should be involved to a greater extent in the problems of health care systems. Over the subsequent year, the structure and functions of the Center were planned and developed. Various academic disciplines and health care provider resources would be required to grapple with the complex problems of health care. It was also clear that many departments of the Faculty of Medicine and the University would welcome the opportunity to participate in health care research and development programs. The decision was made, therefore, that the Center should be interdisciplinary and interdepartmental.

The importance of community participation in the affairs of the Center was recognized from the beginning, and a number of mechanisms have been developed for involving community individuals and groups in planning and carrying out Center projects.

The Center has evolved in the direction of focusing on four kinds of problems: those having to do with ambulatory care in urban settings, such as upper Manhattan; health system problems relating to specific population groups, such as children, adolescents, the poor, and the elderly in upper Manhattan; the problems and possibilities of ambulatory care related to community hospitals in the United States; and more narrowly defined technological problems, such as expenditures on health care in New York City and queueing problems in ambulatory care.

The Presbyterian Hospital in the City of New York

The Presbyterian Hospital in the City of New York is the corporate title for and includes all of the individual units described below.

The Hospital has an overall capacity of 1,339 beds including bassinets. Its professional staff consists of 1,137 attending physicians, 384 residents and interns, and 114 visiting Fellows, whose nominations to the staff of the Hospital are made by the College of Physicians and Surgeons of Columbia University.

Students from the Faculty of Medicine of the College of Physicians and Surgeons of Columbia University, residents, interns, fellows, and students in various allied health programs use the Hospital's clinic facilities for their instruction. Some 150,000 patients a year are cared for in the hospitals, clinics

and doctors' offices of the Presbyterian Hospital which consists of the following units:

The Presbyterian Hospital

The Presbyterian Hospital, founded as a general hospital in 1868 by James Lenox, was originally located on the block bounded by Madison Avenue and Park Avenue between 70th and 71st Streets. In 1911 the Presbyterian Hospital and Columbia University's College of Physicians and Surgeons entered into an agreement for coordinating the care of the sick with the education and research programs of the College. This was followed by an alliance agreement in 1922 which led to the Medical Center complex which opened in the fall of 1928 at its present location in Washington Heights. In 1943 Babies Hospital and Neurological Institute were consolidated with Presbyterian Hospital. In 1945 New York Orthopaedic Hospital was consolidated with Presbyterian Hospital. Presbyterian Hospital is the single largest hospital unit, having inpatient facilities for the Services of Medicine, Surgery, Obstetrics and Gynecology, Urology, Otolaryngology, Dermatology and Orthopedic Surgery.

Babies Hospital

Babies Hospital was founded in 1887, and located at 657 Lexington Avenue (55th Street), and later moved to two houses at 56th Street and Lexington Avenue. In 1928 Babies Hospital moved to the Medical Center as a separate corporate unit which consolidated with Presbyterian Hospital in 1943. Babies Hospital, the Pediatric Unit, can accommodate 168 patients. A new fourteen story shell addition has been erected; ten floors have been completed. When completed the addition will provide modern patient areas, laboratories, classrooms and special care units.

Pediatric outpatient clinics are maintained in Vanderbilt Clinic. In addition to the general medical and surgical clinics, there are special clinics for children suffering from heart disease, tuberculosis, epilepsy, asthma and other diseases.

The Dana W. Atchley Pavilion

The Dana W. Atchley Pavilion, located on the corner of Fort Washington Avenue and 165th Street, provides facilities for 200 physicians to see ambulatory patients. The first six floors of this 14-story building were occupied in December, 1968. The remaining shell floors are for future development.

Harkness Pavilion

Harkness Pavilion provides in-hospital accommodations for 308 private and semiprivate patients.

The Edward S. Harkness Eye Institute

The Edward S. Harkness Eye Institute, opened in 1933, has a capacity of 52 beds and complete facilities for the medical-surgical treatment of patients with diseases of the eye. In October 1969, a new wing was opened, which provides research facilities and ophthalmologic outpatient facilities.

The Pauline A. Hartford Memorial Chapel

The Pauline A. Hartford Memorial Chapel, dedicated on June 25, 1952, has continuously served patients, professional staff and personnel of the Hospital since that time as a place of prayer and meditation. Made possible by a gift from Mr. John A. Hartford in honor of his wife, through The John A. Hartford Foundation, the Chapel provides an accessible center for the religious activities of the Medical Center. It is a place for both formal worship and private prayer by patients and their families, and by staff and personnel of all faiths. It is open 24 hours a day. The services of all faiths, and occasional organ and choral recitals are broadcast from the Chapel and may be heard by the patients over the Hospital's bedside broadcasting system.

The Neurological Institute

The Neurological Institute, founded in 1909, was one of the first nongovernmental hospitals in this country for the treatment of diseases of the nervous system. It was originally located on 67th Street and Lexington Avenue, moved to the Medical Center in 1929 and was consolidated with Presbyterian Hospital in 1943, making possible a broad basic program of teaching and research in neurology and the treatment of diseases of the nervous system. The Institute has a capacity of 237 beds, including 15 added in 1960 for psychiatric patients.

The New York Orthopaedic Hospital

The New York Orthopaedic Hospital was originally located at 420 East 59th Street, New York, N.Y. and was opened in 1866 largely because of the interest taken in the care of the crippled by Theodore Roosevelt, father of the President by the same name. In 1911 the first spinal fusion operation for Pott's Disease was performed by Dr. Russell A. Hibbs. Orthopaedic Hospital was consolidated with Presbyterian Hospital in 1945 and moved to the Medical Center in December 1950, where it has accommodations for 87 adults. It now occupies the 5th floor of the Presbyterian Hospital building and additional facilities in Harkness Pavilion.

Radiotherapy Center

The Radiotherapy Center, one of the largest

facilities for clinical research and x-ray treatment of cancer, was opened in 1966.

Sloane Hospital for Women

Sloane Hospital for Women was founded in 1886 and was originally located at 59th Street and Amsterdam Avenue. Sloane Hospital moved to the Medical Center in 1928 as a unit of the Presbyterian Hospital. It now occupies two floors of the Presbyterian Hospital and one floor of Harkness Pavilion, providing inpatient facilities for 117 patients and 48 bassinets.

The J. Bentley Squier Urological Clinic

Squier Urological Clinic occupies the 10th floor of Presbyterian Hospital, with additional facilities available in Harkness Pavilion and Babies Hospital for pediatric patients. It contains 46 beds.

Vanderbilt Clinic

Vanderbilt Clinic, originally presented to Columbia University by the Vanderbilt family in 1888, moved to the Medical Center in 1928 as part of the Presbyterian Hospital. It is now the primary outpatient facility for all units of Presbyterian Hospital. Last year there were 387,015 clinic visits. It is essentially a fully equipped outpatient clinic offering complete medical, surgical and speciality services. A modern emergency facility, staffed and equipped to deal with any medical or surgical emergency within the unit, was completed in 1973.

Other Patient Care Institutions Located at the Medical Center

The New York State Psychiatric Institute and Hospital, built and maintained by the State of New York, is a 174 bed hospital with provisions for the study and treatment of all types of psychiatric disorders.

The Washington Heights District Health Center was built and is maintained by the City of New York.

The Columbia-Presbyterian Medical Center Fund, Inc.

The Columbia-Presbyterian Medical Center Fund, Inc. is a non-profit corporation, formed in 1959, to receive and allocate funds for the Development Program of renewal and expansion of facilities at Columbia University's College of Physicians and Surgeons and The Presbyterian Hospital. Its officers are elected as a Joint Board of Trustees from the Boards of Trustees of the University and Hospital. Gifts and grants to the Fund may be made for specific projects, described in the Development Program literature, which is available on request, or they may be unrestricted, to be used by priority of need, as determined by the Joint Board of Trustees.

Report of the Chairmen of the Board

The Presbyterian Hospital in the City of New York



Report of the Chairmen of the Board of Trustees of The Presbyterian Hospital for 1979

The general upturn in the financial affairs of The Presbyterian Hospital that began in 1978 continued through 1979 although at a slower pace. While the financial results are encouraging, we realize that significant problems concerning not only the Hospital but the entire field of health care must be solved if we are to maintain a sound and healthy financial future.

Meanwhile, we are proud of the continued improvement in the quality of health care that we provided last year not only to the Washington Heights community but to the nation at large. These improvements were achieved while the debate continues among those of us who deliver health care services, those who want increased access and better quality of care, and those who are concerned with the control of the economics of the delivery of care. Until that debate is resolved, hospitals like ours will continue to have difficulty. The situation is particularly unsettled in New York State where hearings continue in the legislative committee on the proper method for hospital reimbursement. We need a reimbursement method with incentives for effective, efficient hospital management to replace a punitive bureaucratic method.

During 1979, we strengthened our commitment to greater efficiency and productivity while at the same time brought tighter controls on hospital spending. Here is a review of financial highlights:

- Total operating revenues for 1979 were \$156,386,000 compared with \$143,153,000 in 1978.

- Total operating expenses were \$162,548,000 compared with \$151,050,000 in 1978. The increase, a modest seven percent, reflects the Hospital's continuing effort to control costs.

The loss from operations in 1979 was \$6,162,000 a reduction from \$7,897,000 reported last year. However, when non-operating revenues such as investment income, legacies and contributions, and before optional vacation accruals are included, a net gain of \$623,000 resulted with a net loss of \$884,000 in 1978.

Operating revenues are derived mainly from patient services. There were 41,712 patients admitted to the Hospital in 1979 compared with 42,017 in 1978. Patient days amounted to 397,859, down significantly from the 400,747 reported in 1978. The average length of stay was 9.50 compared with 9.46 in 1978.

Out-patient visits, however, increased, the Vanderbilt Clinic had 387,015 patient visits in 1979 compared with 358,494 in 1978 and doctors private offices had 261,372 visits compared with 252,599.

The Vanderbilt Clinic continues to show significant operating losses primarily because of the high level of allowances for free care in the clinic and Medicaid reimbursement rates that do not reimburse the Hospital for its full cost.

For example: a clinic visit cost the Hospital \$58.11 in 1979; the Medicaid weighted average rate was \$45.52. Emergency Services cost \$69.71 in 1979; the Medicaid weighted average rate \$52.98.

This inadequate rate structure probably will con-

tinue through 1980 unless the legislature provides some relief. We believe that reimbursement payments must be based on budgeted costs.

The new budgetary control with cost center reporting system, installed in 1978, was operational for the full year of 1979. The Hospital also changed its method of accounting for investments and vacation pay. These changes are part of our continuing effort to control costs and to portray the financial status of the Hospital in a conservative manner.

The Hospital is very much aware of the needs of the community in which it operates. We recognize that we are the largest employer in the Washington Heights community and as such have a deep responsibility for the community's welfare. We are encouraged by the work of the health council and will be working with a variety of groups to improve the quality of life in the community.

Priority Projects Program

After the Health Systems Agency and New York State Department of Health gave final approval in May 1979 to major portions of the Priority Projects Program, the construction project began that will upgrade significant parts of the older areas of the Hospital devoted to patient care. The reconstructed areas will meet life safety regulations enacted in recent years, provide air conditioning and enhance the environment of much of Presbyterian Hospital, the Neurological Institute and Vanderbilt Clinic. The overall construction program is under the supervision of Mr. W. Raymond Miller, Director of Physical Plant.

Open wards that are now obsolete are being subdivided and refurbished in order to bring all patients into more private and appropriate surroundings. As physical changes are completed, improvements are being made in programs, operations and locations. For example:

All acute emergency services are being reorganized on the first floor of the Vanderbilt Clinic to improve patient flow and reduce waiting time.

The clinics are being reorganized into group practices with appointment systems, evening hours and other changes aimed at improving service to the community.

Shell space in the Babies Hospital building is being finished to allow more space so that the wards in Presbyterian Hospital can be eliminated. These beds will be used for maternity patients. A delivery suite will be reconstructed that will bring together coordinated activities with the neonatal program.

A floor in the Atchley Pavilion is being developed for a "one class" ambulatory oncology and phototherapy treatment center.

The entire reconstruction program has been planned over the next two years to allow the Hospital to continue its operations without diminishing its services.

Master Plan

Since early 1979, when the Office of Planning was established, its activities have been heavily directed towards completion of planning of the Priority Projects Programs; establishment of the Community Health Council; submission and approval of over 50 project applications; development of the Northern Manhattan Health Planning Initiative; and preparation of a series of reports and studies that will help form the basis for development of a long range master plan for the Hospital.

The planning effort is directed by David L. Ginsberg, Director of Planning. Planning activities are expected to intensify this year and focus on development of a comprehensive goals and mission statement coordinated with the Health Sciences Division of Columbia University. The plan will be developed in collaboration with the directors of services, hospital department heads and administrators as well as with community leaders and local and state health planning organizations. It is expected to provide a framework for the programmatic and facility redevelopment of the Presbyterian Hospital for many years to come.

Community Health Council

In accordance with the pledge made by Dr. Felix E. Demartini, President of the Hospital, the Community Health Advisory Council came into existence in June 1979. With 50 members representing consumers, community organizations, employees, students and representatives of the Hospital, the Council has been active in the implementation of the Priority Projects Program, as well as other community, health-related service and educational programs.

Through its committee structure, Council activities include broad participation in the community. It advises and assists the Hospital in the overall goal of improving health care, defines needs for services and programs, responds to health care problems in the community. The Council participated in the development and review of the Hospital's most recent project application submissions.

The Council has developed and distributed a brochure about its programs. It publishes a semi-monthly newsletter, and it has developed a service program for residents of the community.

Northern Manhattan Health Planning Initiative

As part of its commitment to work actively with the Community, the Hospital is a member of the Northern Manhattan Health Planning Initiative (NMHPI).

The Initiative brings together community organizations, health care providers and consumers, in an attempt to suggest a long term program to improve services, enhance institutional fiscal viability and establish an ongoing structure to meet patient care needs over the years to come.

As part of this effort, an Ambulatory Network Plan has been proposed to the State that would redress to the community some of the problems of reimbursement and physician recruitment.

We are saddened to report the passing of two honorary trustees: Peter Grimm and Charles Barney Harding.

The Presbyterian Hospital's Board of Trustees welcomed Jon Katzenbach as a new member and Dr. Henrik H. Bendixen, Dr. Alexander Garcia, and Dr. Robert T. Whitlock as ex officio members. Dr. Garcia was elected President of the Medical Board and assumed that position in June following the retirement of Dr. Edward B. Schlesinger. Dr. Schlesinger has retired as Director of Neurological Surgery Service but is serving as Acting Director until a successor is named.

Resigning from the Board during the year was Nicholas F. Brady, Coy Eklund, Vernon E. Jordan, Jr., and William A. Klopman. Joseph A. Buda, M.D., Keith Reemtsma, M.D., and Edward B.

Schlesinger, M.D., resigned as ex officio members of the Board.

Harold H. Helm, Vice President of the Board of Trustees, and Roger M. Blough became honorary trustees. Mr. Helm retired in 1979 as Chairman of Medi/Center I.

We mourn the passing of the following doctors: Bernard Schoenberg, Maynard C. Wheeler, Morton Hoberman, Isidor Mufson, J. Burns Amberson, Philip M. Johnson, Alvin H. Polatin and Robert S. Krooth.

Edward H. Noroian, Executive Vice President of the Hospital, has been made a trustee of the Greater New York Hospital Association and the Hospital Association of New York State.

We would like to take this opportunity to thank the Professional and Administrative Staffs, Personnel, members of the Women's Auxiliaries and our corps of Volunteers for their dedication and cooperation. We also extend our sincere thanks to all who provided financial support during the year, and we respectfully ask that they continue their thoughtful and vital assistance.

Thomas H. Choate

Thomas H. Choate
Chairman of the Board

John W. Brooks

John W. Brooks
Co-Chairman of the Board

Report of the President of the Medical Board

The Presbyterian Hospital in the City of New York

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Report of the President of the Medical Board

The Presbyterian Hospital in the City of New York

The year 1979 has been one of continuing education and adjustment for the Medical Board. Under the able leadership of Dr. Edward B. Schlesinger, who retired from his post as President in June, the Medical Board over the last few years has had to re-examine its role in relationship to both the Professional Staff and the Administration of the Hospital. It has become clear that the role of the professional within the Hospital, and particularly within the framework of an academic medical center, has had to change. Whereas at one time we were able to pursue a life of academic medicine with little regard for external forces, we now realize that it is impossible for the doctor in the leadership role not to be informed of and involved with the needs of society.

This has been made particularly evident in the past year when the major plans put forth by the Hospital, for an upgrading of Hospital facilities, had to be revised because of community concerns. New health planning laws required an increased sensitivity to consumer needs and established a process through the Health Systems Agencies, to make us more responsive to health needs as perceived by the community.

The Medical Board, with the Hospital Administration, responded by strongly supporting and helping to organize the Presbyterian Hospital Community Health Council. This organization is composed of members of many of the local community agencies, and other community members, who work in conjunction with members of the Hospital Administration and Professional Staff to advise the Hospital in matters relating to health care services, planning,

patient relations and government action and legislation, focusing on ambulatory care services.

In addition, this endeavor has been continued with the formation of the Northern Manhattan Health Planning Initiative in which the Medical Board has played an important role. The goal of the NMHPI is to develop a comprehensive health care plan tailored to the needs of Northern Manhattan.

The Medical Board continues to be tuned to a changing world and earlier this year reviewed the retirement policy here for the Professional Staff, in response to its wishes. We endorsed a change in the policy which would allow attending physicians to continue in practice to age 73 rather than age 70, as formerly, and this change was accepted by the Board of Trustees.

The Medical Board has been reviewing alternate ways of delivering medical care and is currently considering the feasibility of a Health Maintenance Organization here at the Medical Center. An ad hoc committee has been appointed by the Medical Board to explore this option and make recommendations.

The Medical Board has appointed a committee, which is working closely with the Hospital and University, to review the feasibility of constructing a hotel in the vicinity of the Hospital. The benefits of this undertaking are obvious. Not only would it be a convenience for patients and their families, but it would have the two-fold effect of upgrading the surrounding area and providing employment opportunities.

The Medical staff, realizing that health care re-

sources are limited, have focused in on methods of assuring their more efficient use. This has been accomplished via a Utilization Review committee which is part of a city-wide P.S.R.O., responsible for monitoring bed utilization.

The Administration and the Medical Staff have worked closely in planning the Priority Projects Program. There have been hundreds of meetings, consuming many hours of time, trying to agree on changes and to assign priorities. The establishment of a budgeting system for the various Services has alerted the staff to the importance of proper planning, and made us all more conscious of costs. As a staff, we are more aware of the importance of the budget as a method of allowing more effective and equitable assignment of resources, and as an aid in controlling costs.

The Medical Board this year noted with sadness the death of Dr. H. Houston Merritt, Dr. Bernard Schoenberg, Dr. Anthony N. Domonkos, Dr. J. Burns Amberson, Dr. Maynard C. Wheeler, Dr. Alvin H. Polatin, Dr. Philip M. Johnson and Dr. Robert S. Krooth.

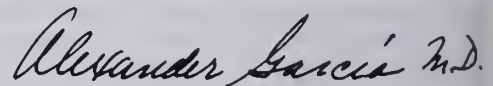
The Medical Board wishes to thank Dr. Edward B. Schlesinger for his thoughtful and considerate guidance over the last three years as President. We were fortunate in being able to retain him for another year as a member, in his capacity as Acting Chairman of the Department of Neurological Surgery. He has also been appointed Consultant in the Neurological Surgery Service.

The Medical Board also wishes to thank Dr. James A. Wolff who retired this year as Chairman of the Blood Bank Committee and turned this duty over to Dr. Peter W. Carmel. Dr. Wolff has been appointed Consultant in Pediatric Service.

Other Consultants appointed this year were Dr. David V. Habif in Surgery and Dr. Samuel F. Thomas in Neurology.

The Medical Board wishes to thank in a special way the Board of Trustees of the Hospital for their unanimous approval of the funding for the Priority Projects Program. This approval expresses in a tangible way the Trustees' faith in the Professional Staff and Administrative leadership of the Hospital, in maintaining academic excellence with concern and compassion for those in need of medical care.

I would like also to express the gratitude of the Medical Board to the Trustees of Columbia University and the Trustees of Presbyterian Hospital for their renewed and untiring efforts in resolving long standing fiscal differences. The reactivation of the Joint Administrative Board will insure the future of this great Medical Center.



Alexander García, M.D.
President, Medical Board

Annual Reports for 1979

Vice President for Health Sciences

Dean of the Faculty of Medicine

Dean of the Faculty of Dental and
Oral Surgery

Columbia University in the City of New York

THE HISTORY OF THE

REIGN OF KING CHARLES THE FIRST

BY SAMUEL JOHNSON

IN THREE VOLUMES.
LONDON: Printed by J. DODD, in Pall-mall, 1743.

Annual Report for 1979

Vice President for Health Sciences



Health Sciences Faculties
Columbia University in the City of New York

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Report of the Vice President for Health Sciences

It is my honor to submit the seventh Annual Report of the Vice President for Health Sciences of Columbia University for the year ending December 31, 1979. This Report marks a decade during which I have served as Dean of the Faculty of Medicine and Vice President for Medical Affairs from July 1, 1970 through June 30, 1973 and, during the past seven years, as Vice President for Health Sciences. It has been a decade during which we experienced important and dramatic changes in programs, faculty and facilities in the Health Sciences. These changes, on the whole, represent considerable accomplishments for Columbia University's Health Sciences faculties and its affiliated teaching hospitals. The decade was marked by emphasis on the need to make our educational programs and our service programs more responsive to the health care needs of our people.

At the beginning of the decade there was the perception that one of the basic problems in providing for more effective health care was a shortage in the number of health care professionals. By the close of the decade, in part owing to significant expansion in almost all health professional training programs, an expansion in which Columbia participated, priorities shifted. There is a growing consensus that further needed improvements in health care will be related not so much to increased numbers of professionals as to a reordering in the type of professionals being trained. For example, greater emphasis is being placed on training primary care physicians, expanding facilities for care in ambulatory settings, and instituting programs that would contain the rapidly escalating costs of health care.

The decade also witnessed dramatic advances in biomedical science and in clinical practices. Approaches to manipulation of genes which at the beginning of the decade seemed remote are today a reality. Advances in such techniques as recombinant DNA, cell transformation, identification and analysis of the function of receptors on cell surfaces and insight into the detailed structure of important biological substances are a few areas of this new knowledge. There have been marked improvements in our approach to the treatment of a number of diseases, such as hypertension and many forms of cancer, and in our capacity for open-heart surgery and organ transplantation. Approaches to the prevention of disease has become an area of increasing priority as we have recognized that this may be the most effective means for improving the health status of our population.

Faculty

In the Annual Report for 1970, it was noted that "the major priority for the College of Physicians and Surgeons on July 1, 1970 was the recruitment of faculty to fill the several positions which had become vacant. . . There is no more important determinant of the quality and purpose of our academic institutions than its faculty and student body." The decade has been particularly gratifying with regard to the success of our efforts at recruitment. New and outstanding leadership has been recruited to the Departments of Anatomy, Anesthesiology, Biochemistry, Dermatology, Human Genetics and Development, Medicine, Microbiology, Neurology, Neurosurgery,

TABLE 1
DEGREE CANDIDATES IN THE HEALTH SCIENCES

		1972-73	1974-75	1977-78	1978-79
FACULTY OF MEDICINE					
<i>School/Department</i>	<i>Degree Program</i>				
Medicine	Doctor	573	580	593	596
	Master	19	28	30	21
Nursing	Bachelor	289	363	413	401
	Master	29	28	66	118
Occupational Therapy	Bachelor	24	27	2	0
	Master	30	34	63	63
Physical Therapy	Bachelor	19	21	0	0
	Certificate	26	30	52	46
Public Health	Doctor	13	21	54	57
	Master	127	155	271	313
Psychoanalytic Clinic	Certificate	43	37	33	34
TOTAL:		1,192	1,324	1,577	1,649
FACULTY OF DENTAL AND ORAL SURGERY					
Dental & Oral Surgery	Doctor	184	198	221	223
	Postgraduate	52	42	29	41
Dental Hygiene	Bachelor	57	69	65	53
	Master	25	23	18	22
TOTAL:		318	332	333	339
GRADUATE FACULTIES					
	Doctor	117	77	99	108
	Master	32	88	59	66
	TOTAL:	149	165	158	174
GRAND TOTAL OF DEGREE CANDIDATES:		1,659	1,821	2,068	2,162

Nursing, Obstetrics and Gynecology, Ophthalmology, Orthopedic Surgery, Otolaryngology, Pediatrics, Psychiatry, Public Health, Rehabilitation Medicine, Surgery, the International Institute for Human Reproduction, the Institute for Human Nutrition, and the Cancer Center. Equally important have been additions at senior and junior faculty levels. During this decade we have also achieved recruitment of the Dean of the Faculty of Medicine and of the Faculty of Dental and Oral Surgery, as well as several other key administrative offices. While the magnitude of faculty recruitment that faces us as we enter the decade of the 80s may not be as great as at the initiation of the decade just past, faculty recruitment remains a matter of the highest priority. For example, Dean Helen Pettit of the School of Nursing has announced her desire to step down when a successor can be identified. Dean Pettit has provided outstanding leadership to the School of Nursing. The tragic and untimely death of Professor Robert Krooth, Chairman of the Department of Human Genetics and Development, has left a critical vacancy which we are also seeking to fill. The departure of John Bryant for government service has necessitated a search for a new Dean of the School of Public Health.

We were all shocked and deeply saddened during the past year by the death of Dr. Bernard Schoenberg, Associate Dean of the Faculty of Medicine, who had been the vital force in the development and expansion of our programs in medical ethics and society. Recruitment of a successor for Dr. Schoenberg is critically important.

Educational Programs

The nature of the educational mandate to the Health Sciences Faculties of Columbia University is such as to require constant analysis of the curriculum in all our programs. In part, this reflects continuing and rapid advances in the scientific base of medicine. In part it reflects the very nature of our educational goals; namely, to develop professionals to serve across the broad spectrum of the health enterprise—a goal that requires a continuing sensitivity to changing opportunities, expectations and constraints on health professionals, be they biomedical investigators, family physicians, nurse practitioners or public health officers. During the past decade there have been a number of important changes in our educational research and service programs. Details of curriculum changes are provided in the reports of the Deans of

TABLE 2

POSTGRADUATE—CONTINUING EDUCATION COURSES
HEALTH SCIENCES FACULTIES

	1974-1975		1977-1978		1978-1979	
	# of Courses	Enrollment	# of Courses	Enrollment	# of Courses	Enrollment
<i>Faculty of Medicine</i>						
Medicine	39	2,714	68	4,052		
Public Health	8	277	10	221		
TOTAL:	47	2,991	78	4,273		
					(postgraduate courses of all Faculties are now consolidated)	
<i>Faculty of Dental and Oral Surgery</i>	22	396	17	626		
TOTAL:	69	3,387	95	4,899	96	6,500

the Faculty of Medicine and of the Faculty of Dental and Oral Surgery as well as in those of the chairmen and directors of the several departments and institutes. Here I would briefly note some highlights of our programmatic achievements of the past several years. In an attempt to develop a multi-disciplinary, interdepartmental and, indeed, interschool effort to deal with research and development in the areas of health systems, the University established a Center for Community Health Systems in 1972 with the very generous aid of grants from several foundations. The Center has concerned itself with research in the areas of primary and emergency health care, child health care networks, nursing home policy, self-help among elderly patients and interaction among our affiliated health care institutions such as the St. Luke's-Roosevelt Hospitals and our outreach programs with Overlook Hospital and Morristown Memorial Hospital.

In the early 70s, the development of more effective approaches to the prevention and treatment of cancer was given a high national priority. Responding to this national policy, the Health Sciences Faculties developed a Cancer Center to coordinate the relatively extensive ongoing commitments to research, teaching and patient care in cancer and to provide for appropriate new and expanded programs in these areas. During the past year, this effort was recognized by the designation of Columbia University as one of 21 Comprehensive Cancer Centers by the National Cancer Institute.

Other major laboratory and clinical research programs were developed in the areas of atherosclerosis, neurobiology and neurological diseases, organ transplantation, immunology, family planning and human

reproduction, primary health care and premature infant care. A clinical research center was developed at the Columbia Presbyterian Medical Center, supported by a grant from the National Institutes of Health; the center has already achieved a number of important successes in several areas of clinical investigation.

Students and Faculty

The decade has seen an almost one-third increase in the number of full-time students on the Health Sciences campus (Table 1). These 2,162 students are enrolled in fourteen different degree-granting programs and two certificate programs. In addition, during the past ten years there has been a marked increase in postgraduate and continuing education programs (Table 2). In 1970-71 somewhat under 3,000 students registered for 42 different postgraduate courses compared to over 6,500 students who registered for 69 different courses in 1978-79. Our faculties also have teaching responsibility for some 1,800 house staff and trainees (Table 3). The number of our faculty increased slightly this year (Table 4).

TABLE 3

HOUSE STAFF/HEALTH SCIENCES FACILITIES

	1978	1979
Residents	1,106	1,172
Trainees	382	213
Fellows	221	260
Visiting Fellows	136	143

TABLE 4
NUMBERS OF MEMBERS OF THE FACULTIES OF THE HEALTH SCIENCES

	1972-73	1974-75	1977-78	1978-79
<i>Faculty of Medicine</i>				
Full-Time	821	775	747	772
Part-Time	1,461	1,669	1,907	1,842
<i>Faculty of Dental and Oral Surgery</i>				
Full-Time	35	28	36	40
Part-Time	239	261	349	400
Total Full-Time	856	803	783	812
Total Part-Time	1,700	1,930	2,256	2,242
TOTAL:	2,556	2,733	3,039	3,054

Affiliated Hospitals

The Health Sciences Faculties continue to be unique among the faculties of Columbia University in having as an integral part of their academic mission the requirement for patient service settings for the teaching of our students in our clinical programs. These include degree-granting programs for the M.D., D.D.S., Nursing and several of the Public Health degrees and for the degree and certificate-granting programs in Occupational Therapy and Physical Therapy. A number of our postgraduate and continuing education programs require clinical service settings in their curriculum. With the exception of our dental clinics, Columbia University achieved these educational settings through our affiliated teaching hospitals (Table 5). The past year has seen significant improvements in the already strong relationship with our oldest affiliate, Presbyterian Hospital. The merger of two other of our primary teach-

ing affiliates, St. Luke's Hospital Center and Roosevelt Hospital, promises important new opportunities for programmatic development during the coming decade. Affiliations with Overlook Hospital and Morristown Memorial Hospital in New Jersey and the upgrading of our affiliation with the Helen Hayes Hospital, New York State Rehabilitation Center, achieved during the past several years, offer important opportunities for the further development of educational and research programs across the broad spectrums of community medicine and rehabilitation medicine, respectively.

Finances and Administration

An important aspect of the development of the Health Sciences Faculties during the past decade has been the creation of an effective administrative and financial management structure. This included establishing the office of Deputy Vice President for Health Sciences Administration, which has been primarily responsible for monitoring the revenues and expenditures of the Health Sciences Faculties. These revenues and expenses have grown over the past decade from levels of approximately \$60,000,000 in 1971 to approximately \$115,000,000 in 1979 (Table 6).

During the past decade we have successfully completed over \$50,000,000 of construction or renovation on the Health Sciences Campus, the centerpiece of the program being the Julius and Armand Hammer Health Sciences Center. This facility has literally transformed the educational and research programs of our faculties and for the first time in our modern history provided a suitable library and information

TABLE 5
HOSPITALS AFFILIATED WITH
COLUMBIA UNIVERSITY

<i>Institution</i>	<i>Type</i>	<i>Bed Capacity</i>
Presbyterian Hospital	Voluntary	1,339
Harlem Hospital Center	City	1,100
St. Luke's Hospital Center	Voluntary	773
Roosevelt Hospital	Voluntary	595
Overlook Hospital	Voluntary	540
Mary Imogene Bassett Hospital	Voluntary	183
New York State Psych. Institute	State	180
Helen Hayes Hospital	State	150
Morristown Memorial Hospital	Voluntary	689

support system for the campus. The decade has also seen an increase of \$45 million in our endowment funds.

Our capital campaign and new construction and renovation programs and, the increasingly complex federal, state and city regulations related to our programs necessitated the development of offices for campus construction, grants and contracts management, and, jointly with the Presbyterian Hospital, a full-time director and staff for the Columbia Presbyterian Medical Center Fund, Inc. Since 1974, the Health Sciences Faculties have maintained a balanced budget. Despite reordering of priorities and decrease in available funding from external sources for a number of programs, the Health Sciences Faculties have continued to compete successfully for a

record level of government grants and contracts for research and training. The success of the Health Sciences Faculties in attracting this external funding on a national competitive basis is, of course, a tribute to our faculty and its programs. The College of Physicians and Surgeons stands among the national leaders in external funds awarded per faculty member.

In 1973, a new administrative organization for the faculties of the Health Sciences of Columbia University was implemented to provide a more effective system for academic management of these faculties. On the recommendation of President William J. McGill, the Trustees of Columbia University approved the establishment of a standing committee of the Trustees on the Health Sciences and the separation of the office of the Vice President in charge of Medical Affairs and the Dean of Faculty of Medicine, with a change in the Vice President's title to the Vice President for Health Sciences. These administrative changes reflected in part the growth in the Health Sciences Faculties within the University dating particularly from the post World War II years. By various criteria, Columbia University's Health Sciences Faculties in the late 1940s represented probably less than 15% of the University's activities. During the past decade it has grown to represent as much as 40 to 45% of the University's programs. The Trustees Committee on the Health Sciences has played an extremely important and supportive role in the progress that has characterized the Health Sciences Faculties' growth in programs and facilities during the past several years.

TABLE 6

REVENUES AND EXPENDITURES

Health Sciences Faculties

Columbia University

*Fiscal Year Ending June 30, 1979**(In Thousands)**Revenues*

General Income Revenues

(Tuition & Fees,

Indirect Costs,

N. Y. State Aid)

23,623

Restricted Revenues

90,807

Total Revenues

114,430

Expenditures

General Income Expenditures

Academic

7,747

Libraries

227

Buildings & Grounds (direct)

6,299

Security

608

Registrar, bursar, personnel

352

Rent of facilities

804

16,759

Endowments, Gifts &

Receipts for Special

Purposes

40,578

Government Grants &

Contracts

Research & Training

34,229

Service

16,000

Total Expenditures

50,229

Available for Central

Service

6,864

TABLE 7

CAPITAL CAMPAIGN
HEALTH SCIENCES FACULTIES
PLEDGES AND RECEIPTS*(As of June 30, 1979)**Project**Total*

Hammer Health Sciences Center—

Augustus Long Library

Construction \$28,823,077

Site Acquisition 1,993,333

30,816,410

P & S Renovation: School of

Dental & Oral Surgery

10,183,070

Endowment

25,616,953

Special Funds

3,404,744

Unrestricted

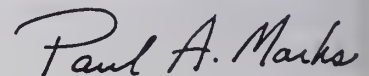
3,431,965

\$73,453,142

Capital Campaign

During the past decade, the most important capital campaign in the history of Columbia University's Health Sciences Faculties was carried forward jointly with the Presbyterian Hospital. The objective of the joint campaign, established in 1973, was \$133.5 million dollars. Of this amount approximately \$58 million was earmarked for facilities and endowment programs of the University. As of December 31, 1979, the funds generated for University projects was approximately \$70 million (Table 7). While certain programs such as the Hammer Health Sciences Center and P & S renovation are not yet fully funded, we have significantly exceeded the goals in other areas such as endowment. We face the coming decade with strength in our capacity for fund raising as well as a heartening increase in support, on an annual basis, from alumni of all our schools. These accomplishments are in no small part owing to the dedicated and effective leadership of our Trustees, in particular, Mr. Harold Helm, Trustee Emeritus of

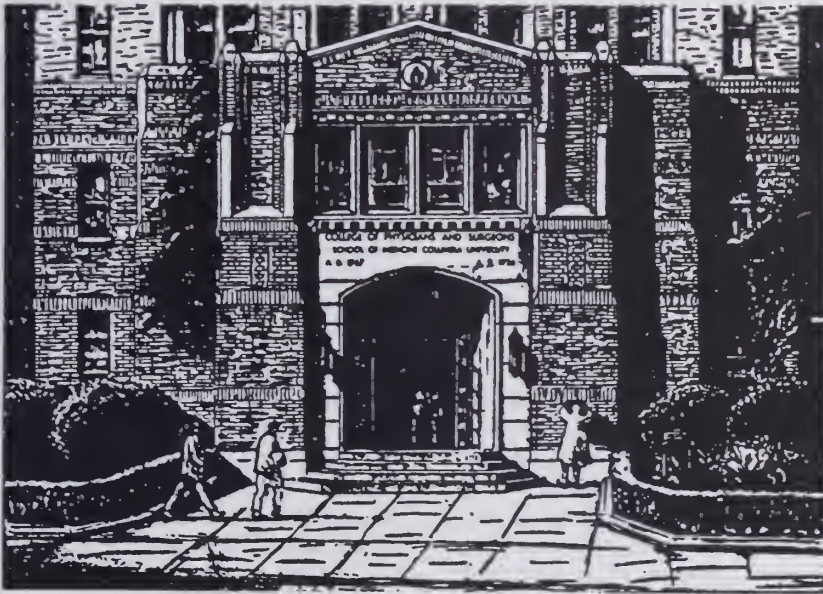
the Presbyterian Hospital and Chairman of the Drive and Mr. Robert D. Lilley, Trustee of Columbia University and Co-Chairman of the Drive. In addition, we have had widespread and strong support from our faculty and major grants and gifts from Federal and State governments, foundations, friends and alumni. Our continuing efforts are directed toward the remaining requirements for renovations which include completion of the renovation of the P & S building, much needed renovation of the student housing facilities and, a matter of very high priority, increase in our available resources for scholarship and student aid and faculty salary support.



Paul A. Marks M.D.
*Vice President For
Health Sciences*

Annual Report for 1979

Dean of the Faculty of Medicine



College of Physicians and Surgeons
Columbia University in the City of New York

Report of the Dean of the Faculty of Medicine

The year 1979 marked the end of a decade but the Faculty of Medicine preferred to view it as a time to look forward to a new decade. Despite many problems which we shared with a nation in economic flux, we have in recent years consolidated many efforts which now serve as firm bases for future growth. During 1979, with the approaching departure of Dr. William J. McGill as President of Columbia University, a distinguished faculty committee analyzed and reported on the status and future of the University, noting candidly that the University under McGill had acquired remarkable financial stability but effort was needed to restore it academically to the first rank of universities in the world. The Faculty committee noted, however, that such professional schools as P & S had lost none of their luster and were still pre-eminent. It is with some pride that we concur in that assessment, which is not only a feeling shared among the P & S community but an evaluation documented by such objective facts as our leadership in grants funded on the basis of peer review, the placement of our graduates in first rate postgraduate programs, and the number and quality of our medical student applicants, which remain consistently high despite higher tuition, restrictions on student aid, and the generally negative (if improving) image of New York City as a place to work and live. As our students have become alumni in recent years, they have continued to occupy more than their share of outstanding places in academic medicine as well as in research and clinical practice.

The year was unusually active and productive among our affiliated hospitals. In one of the most remarkable and far-reaching events in the New York City hospital scene for many years, the Trustees of St. Luke's and Roosevelt Hospitals agreed on a merger of the two institutions, to be called St.

Luke's-Roosevelt Hospital Center. The partnership makes this Center the largest hospital complex in the City and promises to greatly strengthen the activities in each, eliminate duplication, and infuse new fiscal health into both institutions.

The future activities of Helen Hayes Hospital were given great impetus by the culmination of long efforts between the Hospital, P & S, and the state of New York to develop new research programs for which the state will allocate major funding. A particularly promising event in respect to this new direction was the appointment of the noted British specialist, Dr. Robert Lindsay, as head of the Bone Center at Helen Hayes. However, it was with great regret that we marked the resignation of Dr. Alice Garrett, who as Director of Helen Hayes Hospital since 1956 had brought it into great prominence and whose efforts were so instrumental in the achievement of the new research and clinical care goals.

Our neighbor state of New Jersey has always been an important focus of academic and clinical programs among our affiliates, and these took on an added dimension through a new affiliation with Morristown Memorial Hospital, which has long been associated with our other New Jersey affiliate, Overlook Hospital in Summit, in a consortium arrangement.

Several important appointments were also made in our affiliated hospitals: Dr. Stanley Cortell was named Acting Director of Medicine at St. Luke's, Dr. Leo Wilking Acting Director of Pediatrics at St. Luke's, and Dr. Richard N. Podell Director of Family Practice Residency at Overlook.

A particularly satisfying appointment was that of Dr. Solan T. Chao as Director of Obstetrics and Gynecology at Harlem Hospital. Dr. Chao has for several years been head of the Upper and Western

Manhattan Regional Perinatal Network in which Harlem Hospital has a major role, and he brings that experience with him to what is a crucial post at Harlem. The Network will be directed in future by Dr. Harold Fox.

During the year our academic and administrative programs were greatly strengthened by a number of major appointments and designations.

Dr. Darryl C. DeVivo was designated the Sidney Carter Professor of Neurology. Emeritus status was granted to Dr. David B. Habif, Milstein Professor of Surgery; Dr. Edward B. Schlesinger, Byron Stookey Professor of Neurological Surgery, Dr. James A. Wolff, Professor of Pediatrics; Aubrey L. Maynard, Clinical Professor of Surgery; Aaron Karush, Professor of Clinical Psychiatry.

Dr. Thomas Q. Morris, who has ably served as acting chairman of the Department of Medicine since the death of Dr. Kimberg, has accepted new responsibilities as Associate Dean for Academic Affairs. Dr. Linda Lewis has assumed the duties of Associate Dean for Student Affairs. Rachael Goldstein was appointed Health Sciences Librarian. Dr. David Schachter is the new director of the M.D./Ph.D. Program.

Dr. Richard S. Rifkind was named Acting Chairman of the Department of Human Genetics. At year's end, only three of the 25 academic departments were under the direction of Acting Chairman and diligent searches were promising to fill all three chairs permanently within a short time.

In the teaching area, Dr. Brian Hoffman was named chairman of the Second Year Class Faculty and Dr. Michael Stewart was appointed Director of the Office of Primary Care Education.

Our educational efforts were extended to the general public with the inauguration of "Medical Journal" a series of radio broadcasts sponsored by the Columbia-Presbyterian Medical Center and the Prudential Insurance Company. The 90-second news segments are broadcast weekdays during prime listening time over more than 200 major radio stations across the country. They are prepared under the direction of Dr. Henry Aranow, Jr., Samuel Lambert Professor Emeritus of Medicine, as chief medical advisor, and with an editorial board comprised of department and division heads.

A gratifying event once again was the selection of the annual Irma T. Hirschl Career Scientist Awards for the coming year. There are eight medical schools in the New York area eligible for these prestigious awards, and each school is allowed to submit only six nominations. The College of Physicians and Surgeons was awarded three of the 12 available awards, the remaining nine were shared by the other seven

schools. These awards, given to "talented young physicians and scientists" to assist them in their research work, consist of \$15,000 a year for five years for each scientist. This year's awards went to Drs. Qais Al-Awqati and Alan R. Tall of the Department of Medicine, and Dr. Claud P.J. Ghez of the Departments of Physiology and Neurology.

In each of the years since its recent inception the Dean's Day for Student Research, designed to honor and encourage investigation among medical students, has become more successful and has attracted increasingly higher quality entries. On May 2, in a program dedicated to the memory of Daniel V. Kimberg, the following students made presentations and received the Alfred V. Steiner Awards donated by Harcourt Brace Jovanovitch:

David R. Larach, Class of 1980, "A Comprehensive Methodology for Studying Drug Effects on Regional Volume by a Dye-Dilution Technique," Stephen Rayport, '81, "Developmental Uncoupling of Electrical Synaptic Transmission and its Restoration by Epileptogenic Agents," Jerry Sebag '79, "The Effect of Hyaluronic Acid on Prostaglandin Synthesis and Phagocytosis by Mononuclear Phagocytes *In Vitro*," Katherine B. Sims, '79, "Vasoactive Intestinal Polypeptide (VIP) in Mouse and Rat Brain," and Nathaniel M. Sims '79, "Calcitonin Stimulates Specific Protein Synthesis and Release of a 45,000 Molecular Weight Plasminogen Activator in a Porcine Renal Tubular Cell."

On April 14 the College, along with the Schools of Nursing and of Public Health, conducted a minority student recruitment program which was attended by more than 200 potential candidates for admission.

Probably the most remarkable departure from tradition, and a highly successful one, was the selection by the graduating class of actor Alan Alda to give the Convocation address at the 1979 Commencement. At convocation, the P & S Distinguished Service Award was given to Dr. Henry Aranow, Jr., Lambert Professor of Medicine Emeritus; the Dean's Award for Outstanding Teaching to Dr. Thomas Q. Morris, Associate Professor of Clinical Medicine and Acting Chairman of the Department; the Joseph Mather Smith Prize to Dr. Arthur B. Voorhees, Jr., Professor of Clinical Surgery, and the Distinguished Teacher Award, selected by the graduating class, to Dr. Karl S. Perzin, Associate Professor of Clinical Surgical Pathology.

Prizes given to members of the Class of 1979 included:

Alumni Association Award, David S. Morrison; Doctor Harry S. Altman Award, Katherine B. Sims; Herbert J. Bartelstone Award, Ira M. Jacobson; Alvin Behrens Memorial Fund Award, Carl B. Cam-

ras; Coakley Memorial Prize, Geoffrey J. Pollack; Titus Munson Coan Prize, Jerry Sebag; Thomas F. Cock Prize, Steven J. C. Shea; Frederick P. Gay Memorial Award, Paul W. Brandt-Rauf; Janeway Prize, Mary Alice Becker and David J. Kwiatkowski; Doctor Harold Lamport Biomedical Research Prize, Nathaniel M. Sims; The Robert F. Loeb Award, Mary Alice Becker and Ira M. Jacobson; Edith and Denton McKane Memorial Award, Jerry Sebag; Doctor Harold Lee Meierhof Memorial Prize, Peter B. Kelsey; New York Orthopedic Hospital Award, Nathaniel M. Sims; Joseph Garrison Parker Award, Marie E. Csete; Samuel W. and Lewis Rover Award, Andrew C. Wormser; The Sandoz Award, Carl B. Camras; The Helen M. Sciarra Prize, Mitchell F. Brin; Doctor Harold B. Stevelman Prize, Ira M. Jacobson; Upjohn Achievement Award, Katherine B. Sims; Urology Prizes, Scott D. Holmberg, Ira M. Jacobson, Katherine B. Sims, and Carol A. Sulis; Doctor William Perry Watson Award, Deborah F. Raiken; Doctor William Raynor Watson Memorial Award, David A. Kahn; Doctor Allen O. Whipple Memorial Prize, Laurie A. Stevens; Sigmund L. Wilens Prize, Paul W. Brandt-Rauf.

The graduating class, as in the past several years, achieved an outstanding record in the National Interns and Residents Matching Program, with the great majority of graduates obtaining the hospital appointments of their first or second choice. Thirty-seven members of the class obtained appointments at our affiliated hospitals, including 16 at Presbyterian, 11 at St. Luke's, three at Roosevelt, four at Overlook, two at Harlem, and one at Mary Imogene Bassett.

While we take pride in the talents and teaching abilities of our own faculty, we continue to seek new perspectives from notable scientists outside of P & S, in the belief that insularity is a prime enemy of intellectual and personal development. During the year we were privileged to listen and learn from such distinguished scientists as Dr. Dewitt Stetten Jr., of the National Institutes of Health, who discussed "Science: the Third Leg of Medicine" as the twenty-fifth Cartwright Lecturer.

Dr. John A. Parsons of the National Institute for Medical Research in London spent a week at P & S as the William N. Creasy Visiting Professor in Clinical Pharmacology. In addition to teaching rounds and conferences he gave the annual Creasy Memorial Lecture on "Advances in the Therapeutic Use of Peptide Hormones." The Professorship is supported by the Burroughs Wellcome Fund in honor of its former president and Chairman.

During the year several important scientific meet-

ings marked anniversaries or commemorated the great among our present and former faculty. The Neurological Institute marked a double anniversary—the 50th year since the opening of the Institute's building and its merger with the Columbia-Presbyterian Medical Center, and the 70th anniversary of its founding—with a program devoted to "How the Neurological Institute Treats Major Diseases Today." An illustrious group of speakers participated in a symposium on "Advances in Immunology" to celebrate the 65th birthday of Dr. Elvin A. Kabat, Professor of Microbiology and of Human Genetics and Development.

Thanks to the generosity of the Samuel and May Rudin Foundation, we have for several years benefited from the presence of a series of distinguished visitors from other institutions, who have greatly enlarged our knowledge and our horizons not only through formal lectures but, especially satisfying, through informal meetings with faculty and students. The 1979-1980 Samuel Rudin Visiting Professors are in the same tradition of excellence: Sir Richard Doll, the Regius Professor of Medicine at Oxford University, Dr. Norman Geschwind, Professor of Clinical Neurology at Harvard, Professor Paul Berg, Professor of Biochemistry at Stanford University, and Dr. Charles Scriver, Professor of Pediatrics, McGill University.

In June, under the able leadership of Dr. Henry J. Vogel, Professor of Microbiology, the Fourth P & S Biomedical Symposium, on "Regulatory T Lymphocytes" was conducted at Arden House. This year also saw publication of the Proceedings of the third annual symposium titled "Cells of Immunoglobulin Synthesis."

It is with great sorrow that we report the following deaths:

H. Houston Merritt, Henry and Lucy Moses Professor Emeritus of Neurology, Dean Emeritus and Vice President Emeritus of Medical Affairs, on January 9, 1979.

Alvin H. Polatin, Assistant Clinical Professor of Psychiatry, on February 3, 1979.

Hudson J. Wilson, Jr., Clinical Professor of Orthopedic Surgery at St. Luke's Hospital, on February 7, 1979.

Anthony J. Domonkos, Professor Emeritus of Clinical Dermatology, on February 20, 1979.

Isidor Mufson, Associate in Medicine, retired, on March 24, 1979.

Mary I. Crawford, Professor of Nursing and Associate Dean, Nursing, on April 1, 1979.

Aura Severinghaus, Professor Emeritus of Anatomy and Associate Dean Emeritus, on April 7, 1979.

Maynard C. Wheeler, Clinical Professor Emeritus of Ophthalmology, on April 14, 1979.

Bernard Schoenberg, Professor of Clinical Psychiatry and Associate Dean for Academic Programs, on April 25, 1979.

Beatrice Davis, Departmental Administrator for Obstetrics and Gynecology, Harlem Hospital, on March 18, 1979.

Herbert C. Stoerk, Professor Emeritus of Pathology, on July 8, 1979.

Jacob Furth, Professor Emeritus of Pathology, on July 24, 1979.

Robert S. Krooth, Professor and Chairman of Human Genetics and Development, on October 21, 1979.

Philip M. Johnson, Professor of Radiology, on October 21, 1979.

J. Burns Amberson, Professor Emeritus of Medicine, on December 3, 1979.

Shirley C. Fisk, Associate Professor of Clinical Medicine and Associate Dean, retired, on December 25, 1979.

The registration of the School of Medicine in September, 1979, was as follows:

First Year	148
Second Year	152
Third Year	151
Fourth Year	147

In the School of Public Health the registration at the same time was as follows:

D.P.H.	61
M.P.H.	317
M.S. (Biostatistics)	7
M.S. (Epidemiology)	5
Special Students	23
M.P.H./M.B.A. (Joint Program)	25
M.P.H./M.S.U.P. (Joint Program)	1
M.P.H./M.S. Social Work (Joint Program) ...	22
M.P.H./M.D. (Joint Program)	2
M.P.H./M.S. Nursing (Joint Program)	9

In the School of Nursing, enrollment was as follows:

B.S.	384
M.S. (Adult Nursing)	26
M.S. (Gerontological Nursing)	3
M.S. (Maternity Nursing)	31
M.S. (Pediatric Nursing—Ambulatory)	33
M.S. (Pediatric Nursing—Perinatal)	21
M.S. (Pediatric Nursing—Pulmonary)	1
M.S. (Psychiatry and Community Mental Health—Adult)	9

M.S. (Psychiatry and Community Mental Health—Child)	14
M.S. (Anesthesia)	5

In all, 57 students were registered in the course for Occupational Therapists in September, 1979; 48 in the Course for Physical Therapists; 19 in the Institute of Human Nutrition; 31 in the Psychoanalytic Clinic, and 3 in the Master's Program for Clinical Microbiology. There was one candidate in the Doctor of Medical Science program.

The following degrees were conferred in the 1978-1979 academic year:

M.D.	139
M.P.H.	100
D.P.H.	6
M.S. (Nursing, Occupational Therapy, Public Health, Clinical Microbiology, Nutrition)	85
B.S. (Nursing)	130

The following certificates were awarded:

Certificate in Physical Therapy	50
Certificate in Psychoanalysis	4

Medical School Admissions

The national scene in 1979 was characterized by a decrease of some twelve per cent from the preceding year in the total number of people seeking admission to medical school. This growing phenomenon appears to be nationwide in scope and to affect also other schools for health-related activities, such as dentistry (where the drop in applicant totals has been more precipitous than in medicine), osteopathic medicine and optometry. One can only speculate about the causes of this apparent disaffection for the health-related professions, just as we can still only speculate about the true causes for the intense ardor that developed in the early 1970's on the part of young people for an education in one of the "healing" professions.

It seems probable that the growing costs of this type of an education plays a role; the costs are now so great that few parents can provide fully the money needed for their children's education. It has been announced recently that the average American medical student's current indebtedness is some twelve thousand dollars. As state-owned medical schools now comprise some sixty-five per cent of all of American schools and as tuition costs in these schools comprise typically only ten to roughly fifty per cent of the comparable costs in a private medical school, the enormity of the problem can be readily appreciated. And all the more so when one knows that these debts must be repaid at essentially prevail-

ing interest rates, as loans at favorable rates have all but disappeared. It is not uncommon today for P&S students to have, on graduation, a total indebtedness ranging from thirty to fifty thousand dollars. This number may well include debts for an undergraduate education that are still unpaid. The total is even higher for students with spouses who have no income, such as one who is a student in another discipline. It seems likely that a process of selectivity will obtain with regard to aspirations to medicine that is a direct function of the economic status of one's parents.

We received some 4,026 applications for the 148 places in our 1979 entering class, a drop of some thirteen per cent in the comparable total for the previous year. Of this number, 1,269 were women and 309 warranted classification as ethnic minority students. Residents of each of the 50 states and 8 foreign countries were numbered among the applicants. Collectively, they represented students enrolled in some 575 different undergraduate institutions.

The Admissions Committee welcomed the drop in the total number because the only discernible consequence was a decrease in the number of applicants whose credentials were so poor that they would have been well-advised not to apply to us. More importantly for the school, we ended up after the interviews, with a satisfactorily large number of applicants who appeared to have unusually great promise for medical practice and research. In its final composition, the 1979 entering class contained 114 men and 34 women, of whom 13 men and women were classified as ethnic minorities.

Curriculum

With the start of the 1979-80 academic year, curricular revisions were in place for the first, second and third year classes. The first year curriculum had been very successful during its initial year of implementation, so no additional refinements were instituted. The Patient-Physician Relationship course, directed by Drs. Wylie C. Hembree and Steven Rosenberg, continued to bring students into the clinical setting at the start of their medical education. Further perspective on current trends in patient care was gained in the subsequent course, Structure of Health Care Systems, which was also directed by Dr. Rosenberg. Efforts to improve the correlation among basic science courses and the introductory clinical material were concentrated in a First Year Review Committee which was chaired by Dr. Harold Ginsberg.

Particular attention was directed at integration of Pathology and Abnormal Human Biology in the second year curriculum. Teaching of these courses in parallel was hoped to produce an optimal setting for complementary emphasis on pathophysiology and systemic pathology. In addition, major effort was placed on developing additional elements in the Introduction to the Practice of Medicine teaching program. Presentations on "Medicine and Society" by Professor Eli Ginzberg, Director of the Conservation of Human Resources Project at Columbia University, and the A. Barton Hepburn Professor of Economics, continued. For the first time, case-oriented teaching on Issues and Values in Health Care was introduced into the curriculum. This program, which was directed by Dr. Henry Aranow, Jr., Samuel W. Lambert Professor Emeritus of Medicine, was co-directed by Professor Steven Marcus, Delacorte Professor of the Humanities; Professor Richard Kuhns of the Department of Philosophy; and Drs. Eric Marcus and Frank Jewett of the Department of Psychiatry. Coordination among all second year courses was directed by the Second Year Review Committee under the supervision of Dr. Norman Kahn in conjunction with the involved course directors and student representatives.

Elective offerings in the first and second year curriculum continued to increase. Introductory Medical Spanish, given under the auspices of the Columbia University Department of Spanish, was extremely popular. Introductory Cardiopulmonary Resuscitation, organized by the Department of Anesthesiology, was recommended for all students. Several other clinical electives were also made available to the preclinical students.

For the first time, Introduction to the Patient was taught as a block experience during the month of May. Faculty from the Departments of Medicine and Psychiatry conducted this course jointly in order to emphasize not only the acquisitions of skills in history taking and physical examination, but also psychosocial factors in the approach to the patient. In addition, every other clinical department conducted introductory clinical exercises.

The revised third year curriculum emphasized improvements in scheduling and course sequence. Perinatology was introduced as a joint effort by the Departments of Pediatrics and Obstetrics/Gynecology. The Public Health clerkship was combined with an Ambulatory Care Program which will be required for fourth year students as of July of 1980. Planning

for this Ambulatory Care experience was directed by Dr. Michael Stewart, Director of the Office of Primary Care Education. Review of these new developments and revisions was coordinated by Dr. Harold Dick, Chairman of the Clinical Years Review Committee.

Throughout the 1979-80 academic year, successful functioning of the Curriculum Committee was made possible by a group of dedicated faculty and administrative supporting staff. The Planning Committee of the Curriculum Committee consisted of Dr. Thomas Q. Morris, Chairman of the Curriculum Committee, Dr. Norman Kahn, Dr. Eric Marcus, Dr. Harold Dick, and fourth year students, Mr. Paul Dolinsky and Ms. Lisa DeAngelis. The Electives Subcommittee of the Curriculum Committee was chaired by Dr. Peter Puchner. Dr. Lester Geller directed the efforts of the Evaluation Subcommittee. Particular thanks and recognition are due for Dr. Mitchell Schorow, Coordinator of Educational Development, who left the medical school for another academic position. His expertise and tireless efforts made development of the present evaluation program possible. The Curriculum Committee is indebted to Dr. Linda Lewis, Associate Dean for Student Affairs, who participated in and supported the efforts of the Curriculum Committee. The Committee is also most grateful to Mrs. Flora Atkins of the Office of Curricular Affairs, and Mrs. Sharon Kellner, both of whom provided continuous support to both the faculty and students.

Graduate and Postgraduate Medicine

Graduate and postgraduate education at the College of Physicians and Surgeons is under the direction of José M. Ferrer, M. D., Associate Dean for Postgraduate Education. Dr. Ferrer has responsibility for the residency training programs, traineeships, fellowships, Master of Science and Doctor of Medical Science degree programs, certificate programs, and programs in continuing education which are conducted at CPMC and affiliated hospitals and at community hospitals.

Nationwide continuing medical education continues to grow in significance and in the number of offerings. Currently 24 states have enacted legislation or created regulations requiring documentation of participation of physicians in continuing medical educational activities for the reregistration of the li-

cense to practice medicine. Legislation to this effect has been introduced into the New York State legislature with likelihood of passage in the near future. In addition, a number of medical specialty societies and state medical societies, including the Medical Society of the State of New York, have established continuing medical educational requirements for renewal of membership.

The Center for Continuing Education in the Health Sciences is under the direction of Dr. Elizabeth C. Gerst, formerly Assistant Professor of Physiology. The Continuing Education Center is functioning to expand the variety and number of approved activities and to consolidate continuing educational activities at CPMC and other affiliated hospitals. In addition to administering the postgraduate courses and activities for the School of Medicine, the Continuing Education Center has administrative responsibilities for the continuing educational programs of the School of Nursing, School of Public Health, and the Division of Allied Health. Recently the Center assumed administrative responsibility for the continuing educational programs of the School of Dental and Oral Surgery and the Division of Dental Hygiene. The Center is working in conjunction with Robert Gottsegen, D.D.S., Director of the Continuing Dental Education Program, and with Johanna Odrich, R.D.H., M.S., Coordinator of the Dental Hygiene Continuing Education Program.

In addition to administration of activities and programs, the Center has acquired the new and burgeoning responsibility of accurately recording, filing, reporting and documenting continuing educational credits for physicians, nurses, public health personnel, physical and occupational therapists, dentists and dental hygienists. This effort is intended to assist our health professionals in meeting the varying continuing educational requirements of the states and specialty societies. An expansion in personnel has been required to undertake these additional responsibilities.

During 1979, the School of Medicine offered 75 short-term postgraduate courses which were given by 16 departments of the college. These courses were attended by 6,308 physicians, of whom 4,321 were paid registrants, 732 were lecturers in the courses, and 1,255 were audit students from the attending and house staffs of our affiliated hospitals, i.e., Harlem, Helen Hayes, Mary Imogene Bassett, Overlook, Presbyterian, Psychiatric Institute, Roosevelt, St.

Luke's and Morristown Memorial Hospitals. Although the majority of courses were given at CPMC, several were held at our affiliated institutions and at other locations. Physicians attending the courses came from virtually every state of the union, including Hawaii and Puerto Rico and from other countries as far away as Canada, Jamaica, England, the Netherlands, Belgium, Western Germany, Australia, Japan, Portugal, Guam and many countries in Central and South America. One P & S alumnus took advantage of a special program called "Practical Clinical Electives" and spent a week at P & S in the Department of Surgery at the Roosevelt Hospital Center.

The postgraduate medicine courses are primarily clinical in content, designed to refresh and update the knowledge of general practitioners as well as of those who desire training and skills in various specialties. As an institution accredited by the Liaison Committee on Continuing Medical Education, the College of Physicians and Surgeons has certified that these courses meet the definition of a planned program of CME and thus qualify for credits in Category 1 of the A.M.A.'s Physician's Recognition Award. In addition to the 75 postgraduate courses, some 106 other activities such as weekly grand rounds, departmental conferences and lecture series at CPMC and affiliates, have been approved for credit in Category 1. Accurate attendance records are kept and credits reported to the Medical Society of the State of New York for all approved activities. For a nominal fee physicians may receive documentation of accumulated credits at the conclusion of the academic year.

The Continuing Education Center also sponsored 20 continuing educational programs in nursing, allied health, public health and dental hygiene. Of 732 participants, 461 were paid registrants, 122 were auditors, and 149 were lecturers.

A new program of continuing medical education for community hospitals was instituted in 1976. In consultation with each hospital, a program of lectures, seminars or symposia is planned to meet the needs of each individual hospital's staff of health professionals. In 1979, 36 lectures were given at 6 community hospitals located in Connecticut, New Jersey and New York. These lectures were given by 23 members of the Faculty representing the Departments of Medicine, Surgery, Obstetrics-Gynecology, Urology, Psychiatry and Pathology. Attendance records for each of these conferences are kept and the credits reported. Recently each department has prepared an updated list of available lecturers and topics of current interest.

The Continuing Education Center is involved also in the preparation and development of educational materials which meet the criteria for Category 1. These are materials intended for self-study such as audiotapes, videotapes, medical monographs, journals and television programs. Closed circuit TV programs, approved for Category 1 credit, were prepared by Myron Winick, M. D. on nutrition and by Harold Neu, M. D. on infectious diseases for presentation in over 800 hospitals nationwide. Other faculty members are involved in the writing of monographs and audiotape presentations which qualify for CME credits.

Emphasis during the coming year will be on needs assessment and evaluation of offerings. Attempts will be made to determine the specific needs of the practicing physician in terms of continuing education and to evaluate the impact on the care of patients by the physicians who participate in our courses and activities.

The P & S Graduate Medical Education program continues at its usual high level with 1,172 residents in training under faculty members in the various disciplines and departments at all of the affiliated hospitals. There were 213 fellows, 260 trainees, and 143 visiting fellows who took part in our training programs.

This year 7 Doctor of Philosophy degrees and 10 Master of Science degrees in Human Nutrition were awarded. The Institute of Human Nutrition offered 12 courses to 375 students.

Audiovisual Service

It has been a slow but steady rise to a full professional level of multimedia production in medical and health care education. Over a period of eight years, the foundation has been laid for an audiovisual department within a medical school to support the needs of a large medical teaching center in illustration and graphic design, photography, film and television.

This year, the acquisition of some new equipment has enhanced the efficacy of the creative and technical staff and the overall quality of production. Our new high quality video camera produces broadcast calibre pictures in the studio and on location in clinical hospital areas. We can respond, promptly, to requests for patient tapings, with a readily-available studio set and lighting system, and savour the opportunity to record and preserve rare and interesting material for research and teaching. Further refinements in the basic digital editing system have im-

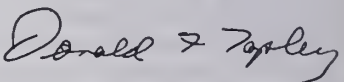
proved our videotape editing facility, which has become a resource for other medical schools in the area. An additional audiotope recorder, donated by the Alumni Association, has contributed to the uniform high quality of audiotapes and soundtracks, and various cables and connections have been completed to facilitate remote control pick-ups from many clinical and teaching areas in the medical center. Additional typesetting equipment has revolutionized our ability to produce *print* in all formats: for graphic designs, television titles, 35mm slides, brochures, convention displays and lecture announcements.

The current status of our facilities has enabled us to support the needs of *two* significant new educational programs for wide distribution, one in studies of medical and health care Ethics & Values, and a second videotape series in Human Nutrition, including talks with early pioneers and current issues in the field. Other projects include the filming of some of

the newest surgical techniques, such as intra-aortic balloon pumping, technical support for the 1979 Neurosurgery, New York City Course and extensive videotape editing for other medical schools.

We have just finished a large project which involved equipping two floors in the Health Sciences Center for the teaching of microscopy in the classroom and the interdisciplinary laboratories. In addition, we have been responsible for the execution of the design and engineering of other media installations here at Columbia-Presbyterian, at affiliate hospitals and outside educational institutions.

All of these endeavors have promoted the use of the AV center as a prime resource, and represent a continuation of our efforts to share and support the needs of medical faculties throughout the metropolitan area in the production, use and distribution of medical education material.



Donald F. Tapley, M.D.
Dean of the Faculty of
Medicine

1979-1980

BASIC SCIENCE DEPARTMENTS

	<u>Full Time</u>	<u>Part Time</u>	<u>Total</u>
Anatomy	19	5	24
Biochemistry	22	19	41
Human Genetics and Development	19	9	28
Microbiology	28	6	34
Pathology	47	102	149
Pharmacology	20	16	36
Physiology	<u>24</u>	<u>2</u>	<u>26</u>
Totals	179	159	338

CLINICAL DEPARTMENTS

Anesthesiology	58	31	89
Dermatology	10	39	49
Medicine	158	319	477
Neurological Surgery	4	12	16
Neurology	57	60	117
Obstetrics & Gynecology	40	100	140
Ophthalmology	29	63	92
Orthopedic Surgery	10	56	66
Otolaryngology	6	32	38
Pediatrics	88	190	278
Rehabilitation Medicine	26	53	79

Psychiatry	26	462	488
Radiology	34	81	115
Surgery	44	137	181
Urology	3	48	51
Totals	593	1683	2276

TOTAL ALL DEPARTMENTS	772	1842	2614
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INSTITUTES & CENTERS

Centers for Community Health	2	2	4
Institute of Cancer Research	18	3	21
Cancer Research Center	12	2	14
International Institute for the Study of Human Reproduction	10	1	11
Institute of Human Nutrition	2	4	6
Sergievsky Center	4	1	5
Totals	48	13	61

SCHOOLS

Nursing	53	30	83
Public Health	85	139	224
Totals	138	169	307
Totals Departments	772	1842	2614
Total Institutes	48	13	61
GRAND TOTALS	958	2024	2982

Without Stated Term

	<u>Full Time</u>	<u>Part Time</u>
University Professor	1	0
Professor	148	7
Professor of Clinical	20	42
Associate Professor	58	2
Associate Professor of Clinical	20	24
Totals	247	75

Annual

Professor	5	1
Professor of Clinical	4	8
Clinical Professor	1	36
Adjunct Professor	0	22
Visiting Professor	1	6
Associate Professor	26	0
Associate Professor of Clinical	29	25
Associate Clinical Professor	15	145
Adjunct Associate Professor	0	26
Visiting Associate Professor	1	2
Assistant Professor	203	2
Assistant Professor of Clinical	88	154
Assistant Clinical Professor	8	351
Adjunct Assistant Professor	0	54
Visiting Assistant Professor	0	4
Associate	13	1
Associate in Clinical	11	204
Instructor	11	3
Instructor in Clinical	32	498

XL • REPORT OF THE DEAN OF THE FACULTY OF MEDICINE

Assistant in Clinical	5	123
Special Lecturer	2	51
Lecturer	1	142
Senior Research Associate	19	3
Research Associate	110	50
Senior Staff Associate	24	4
Staff Associate	<u>103</u>	<u>33</u>
Totals Annual	713	1948
Totals Without Stated Term	<u>247</u>	<u>75</u>
GRAND TOTALS	960	2023
		<u>960</u>
		2983

Report of the Association of the Alumni

The goals of the P&S Alumni Association, founded in 1857, are to maintain close and cordial relations between its alumni and the College, to raise funds for scholarships and research, and to provide school-related services to both alumni and students.

These goals are achieved through the generous voluntary support of the P&S alumni body, which includes all graduates of P&S in the M.D. program, as well as associate alumni, who include faculty, PhD graduates in the Basic Sciences, holders of certificates in Psychoanalytic Medicine, and Residents and Visiting Fellows associated with P&S affiliate hospitals. These make a constituency numbering over 12M. The day to day work of the Alumni Association is accomplished through the efforts of the association officers and those alumni who serve on its 19 standing and ad hoc committees.

The 1978-79 Annual Alumni Fund raised close to half a million dollars for P&S, the major portion of which was used to fund scholarship and research projects, while the remainder was used for such services as the *P&S Alumni Journal*, Alumni Reunion Weekend and the Alumni Chair. Additionally, the P&S alumni component of the Medi/Center I campaign has raised \$104.4 million for capital improvements. The Association wishes to express grateful thanks to its Annual Fund Committee and to all of our alumni and friends who have made this year's drive a success.

The *P&S Alumni Journal*, a quarterly published under the auspices of a volunteer alumni editor and editorial board, has been growing steadily in stature and readership over the last four years, growing so much, in fact, that it was felt to require a more centralized editorial and publication system. Therefore, with publication of the Spring 1980 issues, the magazine will be produced as a combined effort of the Dean's Office and the Alumni.

The Alumni Association recognizes as one of its chief concerns the quality of student life at P&S. For this reason, a substantial component of annual fund revenues has, for the last ten years, been donated to the P&S Student Club in order to help them underwrite such valuable professional groups as the Family Practice Club, the American Medical Students Association, and the Medical Center Coalition, as

well as such social and cultural programs as the Bard Hall Players, the Fine Arts Club, and intramural sports programs.

In addition, the Student Alumni Relations Committee of the Alumni Council, which is composed of both student and alumni volunteers, sponsors a summer job program for first-year students, a cocktail reception for incoming students and a series of forums at which illustrious alumni are invited to speak on subjects of particular interest to the student body. The Association also underwrites a major portion of the annual Minority Student Recruitment Day Conference.

The Alumni Association Annual Reunion Weekend, held in May, is a two-day event consisting of a Dean's Day and Alumni Scientific Session, both for continuing medical education credits, which include catered luncheons and entertainment by the Bard Hall Players. The Honorary Chairman of the Alumni Day Scientific Session this year was the much loved Harold W. Brown, P&S Professor Emeritus, Parasitology. Reunion Weekend also included anniversary class get-togethers, a spouses' program of guided tours at the Metropolitan Museum of Art and the Cloisters and theater parties.

The annual gala Dinner Dance is the culmination of reunion weekend. This dance is given in honor of our new alumni, the graduating class and the 50th Anniversary class, who are the guests of the Alumni Association. They, along with other alumni, faculty, and friends of the association, spent a wonderful evening dining and dancing in the Grand Ballroom of the Waldorf Astoria. It is at this event that the association awards its annual medals for outstanding achievement in medicine and service to P&S. This year's Gold Medalist for distinguished achievement in medicine was Baruch S. Blumberg '51, a Nobel Laureate, for his discovery of the Australia antigen and its causal role in viral hepatitis.

The Silver Medal for meritorious service to the College of Physicians and Surgeons and its Alumni Association was awarded to Gerard M. Turino '48. The Bronze Medal, awarded to a graduating student in recognition of his/her interest in and devotion to the College of Physicians and Surgeons, was presented to David Morrison.

COUNCIL OFFICERS

O. Alan Rose '36 President	S. Jerome Dickinson '53 Recording Secretary
Frank E. Iaquina '51 President-elect	Richard J. Stock '47 Treasurer
Kenneth A. Forde '59 Vice President	Joel D. Weinstein '62 Assistant Treasurer
Carmen Ortiz-Neu '63	Lowyd W. R. Ballantyne '49
Corresponding Secretary	Historian

COMMITTEES

Standing:
 Alumni Relations Committee—Frank E. Iaquina '51, Overall Chairman
 Alumni Day Program Committee—Andrew G. Frantz '55, Chairman
 Continuing Education Committee—Edgar M. Housepian '53, Chairman
 Entertainment Committee—Carmen Ortiz-Neu '63, Chairman
 Regional Representatives Committee—Abram J. Abeloff '26, Chairman
 Student Alumni Relations Committee—Carl R.

Feind '50, Chairman
 Nominating Committee—Lowyd W. R. Ballantyne '49, Chairman
 Alumni Office Committee—O. Alan Rose '36, Chairman
 Annual Fund Committee—Lowyd W. R. Ballantyne '49, Chairman
 Constitution and By-Laws Committee—Dorothy Estes '50, Chairman
 Editorial Board Committee—Robert J. Weiss '51, Chairman
 Executive Committee—O. Alan Rose '36, Chairman
 Finance Committee—Richard J. Stock '47, Chairman
 Honors and Awards Committee—Kenneth A. Forde '59, Chairman
 Special Students Committee—Harry M. Delany '58, Chairman
 Dinner Meeting Committee—S. Jerome Dickinson '53, Chairman

Ad Hoc:
 Alumni Trustee Nominating Committee—Ellis D. Rand '33, Chairman
 Self-Study Committee—Edgar M. Housepian '53, Chairman
 Tuition & Student Finances Committee—Edward B. Leahey, Jr. '73, Chairman

Frank E. Iaquina M.D.

Frank E. Iaquina, M.D. '51
 President
 Association of the Alumni

Annual Report for 1979

Dean of the Faculty of Dental and Oral Surgery



Health Sciences Faculties

Columbia University in the City of New York

THE HISTORY OF THE

REIGN OF KING CHARLES THE FIRST

BY SAMUEL JOHNSON

IN TWO VOLUMES

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THE HISTORY OF THE

REIGN OF KING CHARLES THE FIRST

Report of the Dean of the Faculty of Dental and Oral Surgery • Director of Service

Several important events occurred during 1979 which have broad implications for the future of the School of Dental and Oral Surgery.

In February, the dental school was awarded a \$148,000 grant by the Health Resources Division, Department of Health, Education and Welfare. The grant provides funds for the school to automate some of the clinic management systems. Representatives of the University Computer Center and the Vice President for Health Sciences' office have joined with the faculty and administration of the School of Dental and Oral Surgery in directing the development of the computer program. The long range goal of this program is to provide the school with greater efficiency for the provision of clinical services to our patients and to improve the clinical educational environment for the students.

An increase in the State Capitation awarded by New York State to our school was approved in June of 1979 by the New York State Legislature. The school was gratified that the State recognized the needs of private dental education through the approval of this important legislation. This aid is especially important because it comes at a time of a decrease in financial support to dental schools from the Federal Government's capitation program.

The Faculty Practice Plan, inaugurated in the Fall, makes provision for the faculty to treat private patients on the Health Sciences Campus and affiliated locations. Eight faculty members, who also hold hospital appointments, began to treat patients under the plan. They join four others who have been seeing

private patients at the Atchley Pavilion over the past several years. One of the long range goals of the program is to provide a more comprehensive and complex dental treatment for patients than previously through the student programs.

One of the most important events of the year was a four day site visit by a team from the Commission on Accreditation. After the 1972 accreditation visit, the school was required to institute major changes such as the renovation of our facilities. A thorough review of the renovations and of all programs was conducted. Preliminary reports received indicate that the school should maintain its current favorable accreditation status.

Future financing of the school remains the single most important issue. As one of the few remaining private institutions in the country, the challenges confronting us are formidable. However, with the continued close cooperation of our school faculty, the Administration of the Health Sciences Campus and the University, the School, with careful planning, will be able to find solutions to these challenges.

Faculty

Dr. Sidney L. Horowitz assumed the position of Associate Dean for Academic Affairs in March of 1979. Dr. Horowitz has served as the Director of the Division of Orofacial Growth and Development at the school since 1969. Mr. Gary L. Herrmann, formerly Special Assistant to the Dean and Acting Assistant Dean for Administration, was appointed Assistant Dean for Administration. Dr. S. Abel

Moreinis was appointed to the newly created position of Assistant Dean for Student Affairs.

Three newly created assistant professorships were filled, and a new full-time instructorship was created in radiology. Fifty-three new adjunct appointments were made at eight different hospitals for the new six-week Senior Extramural Rotating Clerkship Program.

We regret to announce the deaths of Dr. Albert Salkind, Clinical Professor of Dentistry, Division of Periodontics, Dr. Jack J. Weiner, Assistant Clinical Professor of Dentistry, Division of Stomatology, and Dr. Arthur Totten, former Director of the Division of Orthodontics.

Upon the invitation of the faculty, two outstanding individuals offered special lectures during the 1979 year. Dr. I. Lawrence Kerr, the President of the American Dental Association, presented the annual Joseph A. Cuttita, Omicron Kappa Upsilon Memorial Lecture on "Dentistry in the 1980's—The Social Issues." An Interdisciplinary Conference sponsored by SDOS, Department of Otolaryngology, and Division of Oncology of the Department of Medicine heard a special lecture by Dr. J. J. Pindborg on "Today's Concepts of Oral Pre-carcinomatous Lesions."

D.D.S. Admissions

One thousand two-hundred and seventy-four (1274) candidates applied for the first year class entering September 1979. Of these applicants one thousand and six (1006) were males and two-hundred and sixty-eight (268) females. Minority students constituted 133 applications. The total number of applicants decreased by approximately 37% from the previous year. The school's drop in the numbers of applications is a reflection of the significant drop in the national pool of candidates over the past two years.

The Admissions Committee granted interviews to three hundred and sixty-eight (368) applicants; forty-one (41) of these were interviewed in California by our West Coast representatives. To complete the class of 60 students, notices of acceptance were sent to 132 applicants, including four minority students. The Committee on Admissions selected 60 well qualified students from a highly qualified applicant pool to fill the first-year class.

The Class of 1983 consists of 45 men and 15 women and includes three minority students. Each has earned a bachelor's degree or its equivalent. They are from 27 different colleges and universities throughout the country. Most are from states on the Eastern Seaboard. Eighty percent are New York State residents.

D.D.S. Curriculum

Major curriculum changes in the planning stages for several years were implemented as part of the clinical academic program in 1978-79. The first of these, the T.E.A.M. Program (Training in Expanded Auxiliary Management), is supported by a federal grant of \$763,235 for the period 1978-1981. The T.E.A.M. Program provides didactic instruction in management skills for all students, as well as a three week full-time clinical experience during the senior year. The aim of the program is to teach students how to practice dentistry as part of a team that includes dental assistants, dental hygienists, and appointment clerks, with emphasis on organizing the team effort efficiently for the most effective provision of care to patients.

The first of a new series of Six Week Extramural Clinical experiences for senior students took place in the summer following a planning conference of hospital dental service directors, faculty of the dental school and students held in the Spring. Several affiliated institutions are involved including: St. Luke's-Roosevelt Hospital Center, Bronx Veterans Administration Hospital, Montrose Veterans Administration Hospital, Beth Israel Medical Center, Booth Memorial Hospital, Lutheran Medical Center, Kings County Hospital Center, North Central Bronx Hospital and the U.S. Coast Guard Dental Clinic, Governor's Island.

Another addition to the junior and senior curriculum during the past year was the inception of interdisciplinary seminars. The seminars, in which both dental school and other health science faculty participate, provide an opportunity for students to review basic biological science information as it pertains to the diagnosis and treatment of patients with various clinical conditions.

Two other changes instituted during the past year include: (1) A course in nutrition provided by the staff of the Institute of Nutrition that has been added to the first year curriculum, (2) a rotation for third and fourth year students in Community Health. This rotation allows students to participate in local health fairs and in community dental health screening programs.

During the past year, the Committee on Instruction reinstituted course evaluation under the general direction of its Subcommittee on Evaluation and Methodology. Dr. Ennio L. Uccellani has been elected as the new chairman of the Committee on Instruction and will take office in January 1, 1980 for a three year term. The Committee on Instruction also decided during 1978-79 on a major revision in the module system. This entails the addition of faculty group leaders who will aid the module directors in the

supervision and completion of clinical work by third and fourth year students.

Dental Hygiene/Admissions/Curriculum

Twenty-one students were admitted to the baccalaureate programs. Six new applicants were enrolled in the graduate program, maintaining the overall enrollment at fifteen. Following the initiation of a minority recruitment program in 1978, the entering undergraduate class was made up of 20% minority students compared to 8% in 1978. Minority student enrollment in the graduate program is 7%.

The graduate program, one of only four programs in the United States that grants a Master of Science degree in Dental Hygiene, continues to be a primary source of preparing dental hygiene educators for teaching and administrative positions at the national and international level. Over recent years, approximately fifty accredited programs of dental hygiene in the United States have received Columbia graduates as faculty members. Of these schools, eighteen are directed by Columbia graduates.

Columbia offers the only program in the State of New York that grants the Bachelor of Science degree in dental hygiene. It is one of only twenty-four in the nation to offer a baccalaureate level dental hygiene program.

Dental Hygiene/Faculty/Research

Dr. Dona E. Wayman, Associate Professor and Division Director, serves as Co-Chairperson of the Joint Allied Health Council and has been reappointed to the A.D.A. National Board Test Construction Committee and as Consultant to the Council on Dental Education, Commission on Accreditation. She serves as a reviewer of grant projects for the New York State Health Research Council. Research in progress includes faculty role consensus as a determinant in role socialization of dental hygiene students, effects of contract grading on academic performance of undergraduate students, and value changes in dental hygiene students over a two-year period.

Ms. Marlene Klyvert, Associate Professor of Clinical Dentistry (Dental Hygiene and Orofacial Development), serves as consultant to N.I.D.R. for the Dental Caries Program Advisory Committee and to the A.D.A., Council on Dental Education, Commission on Accreditation. She is currently completing her doctoral dissertation for partial fulfillment of the requirements for the Ed.D. Degree in Science Education.

Professor Judy Goodrich, clinical supervisor for the Division of Dental Hygiene, is Chairman of the

Committee on Education and a member of the Council on Education for the Dental Hygienists' Association of the State of New York.

Ms. Nancy McVay, senior clinical coordinator, serves as consultant to A.D.H.A. for Community Dental Health. She is conducting research on the correlation between DHAT scores and clinical and academic performance of dental hygiene students.

Ms. Johanna Odrich has recently been appointed as Chairperson of the Admissions Committee for Dental Hygiene. She serves as placement director for First District A.D.H.A. and as a member of the editorial review board for *Dental Hygiene*.

Ms. Linda Bohacek serves the division as faculty advisor to S.A.D.H.A., the student professional organization. She is secretary of the Connecticut Dental Hygienists' Association and delegate to the A.D.H.A. Annual Session for Connecticut; she is also Student Liaison Advisor for all of the dental hygiene schools in District II and is a member of the National Association of Parliamentarians.

Professor Olga Ibsen is a member of the Joint Committee on Radiation Safety of Presbyterian Hospital. She is president of the Westchester County Dental Hygienists' Association and a member of the Council on Educational Services for A.D.H.A.; she serves as a reviewer for the journal, *Dental Hygiene*. She is president of the Lambda Chapter of Sigma Phi Alpha and functions as dental hygiene faculty representative to the Dental Alumni Association of Columbia University. She is involved in research on the analysis of radiation exposure in dentistry.

Ms. Valerie Cooke, senior staff associate in the Division of Oral Biology, continues to lecture for dental hygiene students on Nutrition and Oral Health. She serves as executive secretary to the Dental Hygienists' Alumni Association of Columbia University and is a member of the Commission on Continuing Education for the Dental Hygienists' Association of the City of New York. She also serves as nutritional consultant to the New York City Board of Education. She participated on the nutritional assessment of the edentulous patient through the Institute of Human Nutrition.

Ms. Susan Rod-Graham serves on the executive board of the Clinical Faculty of Columbia University and is Program Chairman for the Dental Hygienists' Association of the City of New York. Ms. Anne Lyons has recently been appointed to the faculty as an Instructor with responsibilities to the Division of Dental Hygiene and the Division of Stomatology (Radiology).

As part of the divisional faculty development program, initiated by Dean Allan J. Formicola, the dental hygiene faculty participated in a CPR course and

all hold American Cross CPR Certificates. The division also sponsored a joint seminar on "Selected Topics in Periodontics," attended by members of the Dental Hygiene and Periodontics Divisions.

Postgraduate Dental Program

All of the postgraduate programs (Endodontics, Orthodontics, Periodontics and Pedodontics) lead to a Certificate of Training which establishes Board eligibility. These programs, designed for advanced specialty training, cover a span of two academic years and are fully approved by the Commission on Accreditation of the Council on Dental Education. Presently there are 40 enrolled postgraduate students and eight residents in Endodontics from St. Luke's Hospital, a Columbia affiliate. The St. Luke's residents receive their didactic, nonclinical educational experience along with our own postgraduate students at Columbia University, School of Dental and Oral Surgery. Included in our present student body are ten women, (two of whom are from minority groups and five are non-resident aliens) as well as five foreign men. The countries of origin of our foreign students are: India, Japan, Greece, Taiwan, Holland, Mexico, Iran and The Philippine Islands.

There has been an increased interest in postdoctoral studies as evidenced by the number of inquiries received concerning specialty course offerings. To document these trends, a new system of maintaining records was instituted.

A major physical improvement has been implemented in the postgraduate area where radiography units have been rebuilt and shielded to offer maximum radiation safety. Plans are now underway for implementing a rotation in anesthesiology for the postgraduate Pedodontic students. A new course in medicine is being structured for Endodontic and Periodontic students and the design of a new ninth floor study area for the use of postgraduate students has been initiated.

Research

Dr. David Kaplan, Director of the Dental Auxiliary Utilization Program, and Dr. Joseph Kafer are studying the procedures, mechanisms, techniques and economics of newly developed large scale dental care systems.

Dr. Irwin Dambrot is developing a practice management modular instructional system compatible with the self-learning hardware at the School.

Members of the Division of Endodontics have been engaged in several research projects this year. Dr. Kim is continuing his investigations concerning blood flow and neural activity in the dental pulp, using vasoactive amines and radioactive Xenon. Dr.

Kim has also been successful in preparing videotapes of the microcirculation of the dental pulp. This work is being accomplished as part of his Ph.D. program under the aegis of Professor Shu Chien (Physiology). Dr. Moreinis, in collaboration with Dr. Melvin L. Morris, has initiated a project involving the various technical and clinical factors that must be considered in the replantation of teeth. Dr. Irving J. Naidorf is continuing his investigations of several aspects of Endodontic Immunology and their relationship to the healing process and the inflammatory response in clinical situations.

Drs. Stanislaw Brzustowicz and Edward A. Cain, Jr. are continuing to investigate the clinical significance of the topical application of superoxol with controlled temperatures in the bleaching of tetracycline stained teeth in the permanent dentition.

Drs. Harold Baurmash and Louis Mandel, of the Division of Oral Surgery (in a joint study with Drs. Irwin D. Mandel and Robert Stuchell of Preventive Dentistry) are utilizing sialography, sialochemistry and labial gland biopsy in a continuing study of salivary gland disease. In a multidisciplinary approach Drs. Victor Sendax, Lawrence Camesas and John Hulbrock are investigating the factors most conducive to implant procedures.

Dr. Solon A. Ellison, Director of the Division of Oral Biology, has begun a program dealing with salivary chemistry and aspects of oral microbial ecology.

Two sets of chemical and immunological studies of salivary secretions, begun while Dr. Ellison was at SUNY/Buffalo, are continuing. Attempts to identify an abnormal mucin in secretions from patients with cystic fibrosis using primate antisera are being done in collaboration with Dr. Robert Mellins and Ms. Jane Anderson, Department of Pediatrics, and Dr. William Socha of the Primate Research Center of N.Y.U. at Tuxedo Park, New York. This work, supported by a grant from the Cystic Fibrosis Foundation, is aimed at confirming earlier observations by Dr. Ellison which suggested that such antisera might detect structural differences in human salivary mucins which could not be displayed by reactions with antisera from more distant species. Other studies, representing continuation of a long collaboration among Dr. I. Mandel, Dr. Michael Levine and Dr. Lawrence Tabak of SUNY/Buffalo, and Dr. Ellison, consist of chemical and immunological studies of proteins and glycoproteins isolated from normal salivary secretion.

A grant and a contract have been awarded by the NIDR to Dr. Ellison for research on oral microbiology ecology in collaboration with Dr. I. Mandel. The grant concerns the role of specific salivary proteins in

controlling plaque flora. It is aimed at describing how these components function to regulate metabolism and multiplication of the normal bacterial flora. The contract is aimed at describing the quantitative changes in plaque composition, microbiology and metabolism which occur when patients are fed by stomach tube rather than eating in the normal fashion. Previous reports suggest that characteristic alterations may occur, most significant of which is decreased cariogenic potential. The work should provide a precise description of plaque cariogenicity as a quantitative, diet dependant parameter.

Research activities of the Division of Orofacial Growth and Development during 1979 encompassed studies in craniofacial morphogenesis, inheritance of dentofacial traits; and craniofacial birth defects. Dr. Melvin L. Moss investigated the epigenetic regulation of ear form in rodents with Drs. David Chiu and George Crikelair; and mineral metabolism and bone with Dr. Letty Moss-Salentijn. In a series of current investigations, Dr. Moss-Salentijn is studying developmental events in the prenatal period including the muscle-skeleton interface, and the skeletal-dentofacial characteristics observed in spontaneous abortions. Both Drs. Moss and Moss-Salentijn are cooperating with members of the Bioengineering Institute (Columbia University) as well as with colleagues at other universities in the United States and Europe on studies of the kinematics of oral cell physiology, skull and facial development.

Drs. Horowitz and Alice Chabora are continuing studies of: inheritance patterns in facial clefting and the craniofacial characteristics of children with the syndrome of gonadal dysgenesis (with Dr. Akira Morishima, Department of Pediatrics of the College of Physicians and Surgeons). Other investigations in which these investigators are active include a study of the effects of growth hormone administration on the growth of the head and face (with Dr. Morishima) and links between the inheritance of foot deformities and craniofacial anomalies (with Dr. Rosamund Kane, Director of the Children's Foot Clinic, Department of Orthopedic Surgery). Dr. Horowitz is also continuing analysis of roentencephalometric data on children with various types of clefts of the lip and palate. This is a joint study with Professor Marcel Bettex and Dr. Brigitte Graf (University of Bern), Dr. Heli Vinkka (University of Turku) and Dr. Louis Cerstman (CUNY).

During the past year, postgraduate students in Orthodontics completed the following studies under the direction of members of the orthodontic faculty: (1) a study of unilateral headgear force, (2) serial extraction treatment in class II deep bite malocclusion, (3) cephalometric comparison of deep bite and normal

bite occlusions, (4) tooth movement with magnetic forces and (5) craniofacial characteristics associated with maxillary incisor fracture.

Dr. Malcolm Meistrell, Jr. is studying the mechanism of Class II correction in non-extraction Begg orthodontic treatment. Drs. Abraham Blechman and Harry Smiley are beginning clinical studies in the use of magnetic forces for orthodontic tooth movement.

The Division of Pedodontics is currently conducting a series of studies under the direction of Dr. Martin J. Davis, Director of the Division: (1) A study investigating glutaraldehyde as an alternative agent to formocresol for vital pulp therapy in primary teeth, (2) The use of intramuscular sedation techniques in managing the handicapped patient, (3) A study involving children with the "Nursing Bottle Caries Syndrome," investigating the levels of knowledge of the parents regarding the condition as compared to compliance with recommendations for preventing, and arresting this syndrome, (4) Comparison of calcium hydroxide pulp therapy vs. formocresol pulp therapy for cariously exposed young permanent molars, (5) Development of teaching audio-visual tapes on "Caring for the Handicapped Patient." The tapes are to include transportation, physical plant considerations, patient positioning, preventive and restorative management, and behavior management of the handicapped patient.

Members of the Division of Preventive Dentistry are conducting a variety of studies, both laboratory and clinical in nature. A major effort is being made to identify host factors in caries resistance. Drs. Stuchell, Camille DiPaola and I. Mandel have developed techniques for quantitating lysozyme and lactoferrin in saliva and plaque fluid and are comparing resistant and susceptible subjects. Dr. David Abelson is studying plaque pH in vivo in the two groups and has demonstrated the importance of salivary access as a major factor in preventing pH drop after a sucrose challenge. Dr. Spyros Vratsanos, utilizing a sensitive chemotographic technique that he developed, has demonstrated that caries resistant people generate much less lactic and formic acid in their plaques than susceptible people, when saliva is available. The differences are markedly diminished in the absence of saliva. Drs. Fine, I. Mandel and Mr. Steve Ilino have shown that caries susceptible subjects exhibit a consistent and substantially higher ratio of *Streptococcus mutans* to *Vellionella alcalescens* in plaque than caries resistant subjects. These studies demonstrate that both salivary and bacterial factors are important determinants in caries resistance and susceptibility. Examination of dietary patterns by Ms. Laura Bardach, Mr. James Geduldig and Dr. I. Mandel clearly showed that there were no significant

differences between the resistant and susceptible subjects and that the resistant group remained free of decay despite environmental challenge.

Drs. I. Mandel, Stuchell and Baurmash have been examining salivary composition in patients complaining of xerostomia (dry mouth) and have established a number of parameters for differentiating chronic recurrent parotitis, Sjogren's syndrome and medication effects.

Drs. Michael Marder and I. Mandel have been studying salivary electrolytes and immunoglobulins in juvenile diabetics and note a consistent elevation in IgG and IgM suggesting the possibility of a basement membrane defect in the salivary glands. Dr. Stuchell has been applying sialochemistry to the study of hypo and hyperthyroid patients and to the search for abnormal proteins in patients with salivary gland tumors.

Dr. I. Mandel in a joint study with Dr. Bronislaw Slomiany of New York Medical College has been examining the role of glyceroglucolipids in salivary calculus formation; with Drs. Leslie Burstein (Periodontics) and Adelle Boskey (Hospital for Special Surgery), he has been exploring the role of phospholipids in ectopic calcification.

Dr. Stuchell, in a joint project with Dr. Lindsay Farris of the Eye Institute has been studying flow rate and composition of tears in diseases of the eye, using techniques developed for study of saliva.

Dr. Vratsanos, who developed a method for quantitatively separating cationic proteins from saliva, has utilized this technique in collaborative studies with other investigators. It is becoming apparent that cationic proteins are involved in modifying permeability of the enamel surface and tooth stain formation.

Dr. Abelson, Ms. Georgette Maietti and Joan Barton have been conducting a series of clinical studies on the effect of new mechanical devices on plaque removal and gingivitis.

Drs. Herbert Oshrain, Bernard Telsey and Susan Friedman are continuing to examine the effect of long term immunosuppression in renal transplant patients on the rate of progression of periodontal disease.

Dr. Robert Breakstone is studying the effect of modification of dietary calcium to phosphorus ratios on periodontal disease in monkeys.

Dr. David J. Zegarelli, Director of the Division of Stomatology is currently concerned with electron microscopic investigation of interesting and rare intraoral lesions, particularly tumors, in hope of yielding information important in histogenesis. In conjunction with Dr. Elena Zegarelli (Pathology) and Dr. George Hyman (Medicine) and Dr. Bruno Fingerhut (Urology), he is conducting studies utiliz-

ing autoradiography in the diagnosis of premalignant lesions. Further analysis is continuing on biopsy specimens taken by Dr. Zegarelli to shed some light on modifying current biopsy technique procedures.

Continuing and expanding research in salivary analysis, Dr. Marder (in cooperation with Dr. I. Mandel) has been investigating salivary electrolytes, enzymes, immunoglobulins and carbohydrate fluctuations in various systemic disease situations including diabetes, hyperparathyroidism, and other endocrinopathies.

Dr. Austin H. Kutscher and co-workers in various departments of the Medical Center are continuing investigations of the usefulness of various therapeutic modalities for the care of mouth problems of patients dying of oral cancer as well as the mouth problems of patients dying from diseases not originating in the oral cavity. These studies include new approaches to and useful efforts for the control of pain, infection, loss of function and dryness, etc. The role of the dentist and dental auxiliary team in home care programs for such patients is being studied as well. These investigators also are studying clinical symptoms, clinical signs and laboratory tests in a pilot retrospective study to find individual or group indicators of terminality (irreversible disease in a final stage) with high predictive value.

Drs. George Hyman, Ralph Veenema, Marian Johnson and Bruno Fingerhut of the Departments of Medicine and Urology, together with Dr. Kutscher and Ms. Beth Robinson are working on the development of clinical diagnostic and predictor tools for use in following and caring for, and in the management of oral premalignant and malignant diseases; it is hoped this will be of special value in monitoring chronic "pre-malignant" lesions of the mouth.

Investigations are continuing in regard to long term problems arising in the mouth and related to anticipatory grief, acute grief and bereavement.

Investigations are also continuing on the acute vulnerability of the mouth as a target organ for disease states of psychogenic origin or those precipitated by psychologically traumatic events; these studies deal with an overview as well as individual disturbances of significance to all involved in the health care of the oral cavity and regions contiguous to it.

Faculty members of the Division of Periodontics are conducting a number of studies in various aspects of periodontal disease and therapy.

Dr. Fine has initiated an assay for epithelial permeability and another on root adherence and has embarked on programs to test and standardize these assays. Along with Professor Lehner and members of his department, Dr. Fine has worked out an immune

complex assay for both crevicular fluid and blood in patients with different varieties of periodontal disease.

Dr. Morris, in conjunction with Drs. Moreinis, Rohit Patel and Aaron Prestup, is conducting an experiment on delayed tooth transplantation in monkeys. Preliminary results seem to indicate that changes in the socket walls before reimplantation may be as important, if not more important, than changes on the root surface in eventually producing ankylosis and resorption.

Dr. Morris, Dr. Fine and Dana Graves are continuing the study of chemicals-used in root surface treatments as they affect both the inhibitory factors and the endotoxins of periodontally diseased roots.

Dr. Morris, Ms. Debby Desirens and Drs. Burstein and John Kosinski are concluding their study of root surface wettabilities. Statistical differences have been found between young, old and periodontally diseased and periodontally healthy roots.

Dr. Morris' recent publication has shown that functionally oriented fibers form on cementum when decalcified autogenous bone is implanted adjacent to the root surface. Further studies, now in press, show that prior decalcification of the root surface prevents the fiber formation. The same negative result is obtained when the root is untreated but marrow is added to the bone implant. As a result of these studies, a new hypothesis of periodontal homeostasis has been proposed which theoretically explains such diverse phenomena as selective patterns of periodontal bone loss and ankylosis following reimplantation.

Dr. Bernard Moskow is continuing his study of the clinical and histologic correlation of gingival tissue types. This has distinct clinical implications in directly identifying the cellular characteristics of gingival tissues in various clinical-pathologic states.

Dr. Moskow is also studying the morphologic changes in alveolar bone associated with progressive inflammatory periodontal disease. Microscopic, macroscopic and radiographic techniques are being employed.

In addition, Dr. Moskow is evaluating clinically the various categories of periodontal lesions in terms of their potential for healing and regeneration of lost periodontal support.

Dr. Kamen, whose research interests involve the biology of epithelium, especially as it relates to oral disease, is utilizing differentiating epidermal cell cultures as a primary research tool. He is initiating a study on the effect of bacterial products on differentiation and growth of epithelium, immune cell-keratinocyte interactions, and aging of differentiating cells in vitro.

Dr. Steven S. Gold is conducting historical re-

search and writing a monograph on Robert Neumann and his contribution to periodontal surgery. He, along with Dr. Morris, have set up a pilot project to test the effectiveness, in vivo, of various treatment methods to remove endotoxin from the periodontally diseased root surface.

Dr. Mario Vilardi is studying the effects of the Hawley Bite Plane on the rate and amount of eruption of posterior teeth and depression of anterior teeth. He is also studying the relationship between the advancing periodontal disease and tooth loss as they effect or create occlusal discrepancies and breakdown.

Dr. Alan Winter has just concluded a study measuring the calibrations on different periodontal probes randomly collected from private practice sources in which he demonstrated that there is a wide range of variability in measured markings on various probes.

Dr. Friedman is working with Dr. L. Mandel in a study to measure lactoferrin and lysozyme in crevicular fluid.

Dr. Robert Gottsegen is developing a new investigation of the possible relationship between diabetes and periodontal disease.

Campaign Drive

The Medi/Center 1 Capital campaign for dentistry continues to seek funds for endowment under its Phase II guidelines. Campaign Co-chairmen Drs. Joseph M. Leavitt and Nathan M. Sheckman reported that \$134,500 was raised in 1979, bringing the cumulative total to \$8,558,500.00.

In order to reach a greater number of alumni throughout the country and enlist their support, the Committee of Concerned Alumni was formed under the leadership of Dr. Richard M. Lichtenthal. Membership in the Committee for Endowment of the Zebarelli Chair has also expanded, with Dr. George V. Lyons joining Dr. Gerard L. Courtade as committee co-chairman. Within the Orthodontic Alumni Campaign, Drs. Robert J. Isaacson and E. Peter Prezzano have been active as newly-appointed vice-chairmen under Dr. Herbert J. Pinsley, chairman of the orthodontic alumni. Among the year's activities were two receptions for orthodontic alumni.

The Class of '41 reached the halfway mark in a class project to raise \$50,000 to endow the Special Services Clinic, and dental hygiene students conducted an alumni telethon in March. The Wall of Honor plaque, honoring donors of \$2,500 or more will be dedicated in the spring.

Almost 100 new alumni donors added their support to the campaign in 1979, pledging \$86,000 toward the endowment objectives of the School. Dr. James M. Dunning, Class of '30, made a personal gift of

\$10,000, establishing a teaching endowment fund in honor of Drs. William Bailey Dunning and Henry Sage Dunning, two of the founders of the School of Dental and Oral Surgery.

Medi/Center 1 activities and achievements are the result of the efforts of Co-chairmen Drs. Joseph M. Leavitt and Nathan M. Sheckman; Honorary Chairman, Dr. Edward V. Zegarelli, Drs. Gerard L. Courtade and George V. Lyons, Co-chairmen of the Committee for Endowment of the Zegarelli Chair; Dr. Morton L. Shapiro, Chairman, and Dr. Lichtenhal, Vice-chairman of the Dental Alumni Campaign; Dr. Pinsley, Chairman, and Drs. Isaacson and Prezzano, Vice-chairmen of the Orthodontic Alumni Campaign; Dr. George A. Minervini, Chairman of Faculty Solicitations; Dr. John J. Lucca, Chairman of Corporate Solicitations; and Drs. Naidorf and Albert H. Weisenfeld, Co-chairmen of the Class of '41. With their continuing dedication and leadership the School of Dental and Oral Surgery will achieve its targeted goal of \$15 million.

Hospital Dental Service

The Presbyterian Hospital Dental Service is under the supervision of Dr. Louis Mandel who serves as the Associate Director of the Service.

In the short span of four years during which the residency program has been in existence, the Presbyterian Hospital Dental Service has become firmly integrated into the hospital's health care system, making the full scope of dentistry available to meet the needs of the hospital's inpatient and outpatient population. However, inherent in such a commitment was the necessity to have the attending dentists as full-fledged members of the medical staff and this was accomplished with the recent revision of the Presbyterian Hospital's Medical Staff regulations, bringing them in line with those hospital dental programs that strive for excellence of care and leadership in the profession.

The commitment to a superior dental service also required that the full range of dental services mandated by the American Dental Association's Commission for Hospital Accreditation be offered to the patient population. Through the cooperation of the hospital Administration and the Departments of Medicine and Surgery, the Dental Service has gained an opportunity to exercise all clinical privileges associated with an active and flourishing dental service and attained an independence commensurate with other hospital surgical services. As a consequence, complete accreditation of the hospital's dental service and residency program was received from the American Dental Association's Council on Hospital Dental Service and Dental Education.

The program requires a dental staff which is not only highly qualified in competence and skill, but also possesses an excellent capacity for teaching. Therefore, it was necessary to increase the size of the professional staff, which now consists of 82 members, 31 of whom have admitting privileges. All specialties and disciplines in dentistry are now adequately represented.

The Presbyterian Hospital Residency Program in General Dentistry is a form of postdoctoral professional education which offers a particularly attractive opportunity for advanced and comprehensive clinical experience in a hospital setting as well as additional training in those sciences basic to dental practice. The program proposed for the two dental residents has been designed to allow clinical exposure in a variety of dental fields. The residents are assigned to the oral surgery, restorative dentistry, endodontics, periodontics, maxillofacial, prosthodontics, pedodontics and orthodontics clinics. Their curriculum includes radiology, pharmacology, oral medicine and clinical pathology, head and neck anatomy, temporomandibular joint seminars and psychiatry. In addition, the residents attend journal club sessions and conferences, oncology, and infectious disease. Block assignments are made to the Department of Anesthesiology, where the residents work for one month, and to the Department of Pathology, for four weeks. The residents also have been encouraged to partake in research and are now engaged in an on-going study of jaw implants.

It is obvious that a program such as ours could only have been made possible through the close cooperation of all the Presbyterian Hospital services and we are indeed very grateful to the Hospital and to the directors of service for their generous aid.

The ability of the Dental Service to deliver dental care to hospital inpatients and to ambulatory medically and physically handicapped individuals has been greatly augmented by the newly completed reconstruction and renovation of the School of Dental and Oral Surgery. The Special Services Clinic for the handicapped, located on the ninth floor of the School, was incorporated into the design of the new school. The new facility serves as the focal point for the delivery of dental care by the dental residents.

Under the guidance and direction of the attending staff, the dental residents have been able to provide an unprecedented range and quality of dental services for hospital patients. As the Dental Service continues to develop, numerous additional benefits, both for the patient and the hospital, are expected. For example, the Division of Pedodontics, in association with the Presbyterian Hospital Department of Pediatrics is offering complete dental care, under general anes-

thetia in the operating room, for physically handicapped and/or emotionally disturbed patients who otherwise might not receive adequate or any dental care. This service is a growing aspect of the residency program. Under the guidance of Drs. Davis and Robert Koweeck, the Pedodontic Division of the School of Dental and Oral Surgery has moved aggressively to offer this care to the large reservoir of patients that require such treatment. A symbiotic relationship has developed offering significant benefits to the School's Pedodontic postgraduate program and to the hospital's dental residency. Continued growth of this parameter of pedodontics can be expected. Another example of inter-service cooperation and improved medical-dental communication is the representation of the Dental Service on various hospital committees. Dr. Louis Mandel serves on the Emergency Committee, Operating Room and Anesthesia Committee and Utilization Review Committee; Dr. Irving J. Naidorf is on the Communicable Diseases and Antibiotics Committee and Staff Committee; Dr. Austin H. Kutscher is on the Medical Care Evaluation, Medical Record and Pharmacy Committee; Dr. Stanislaw Brzustowicz serves on the Parking Committee; Dr. John V. Donovan is on the Electronics Safety Committee; Professor Olga Ibsen serves on the Joint Radiation Safety Committee; Dr. David J. Zegarelli is on the Diagnostic Laboratories Committee; Dr. Lawrence Camesas is on the House Staff Committee.

Association of Dental Alumni

The 1979 program of the Alumni Association, School of Dental and Oral Surgery, featured the following events: The Annual Alumni, Faculty, Hygienist, and Senior Farewell Dinner Dance, chaired by Dr. Sidney Shapiro, with Dr. Minervini acting as Master of Ceremonies, featured the awarding of the Alumni Meritorious Medal for distinguished service to the Association to Dr. Joel Friedman.

The Annual Dean's Day (Alumni Homecoming) program was addressed by Dean Formicola, who traced the history and growing importance of the Fred Birnberg Award for Research, given this year to Dr. Berge Hampar, Columbia Dental Class of 1960 and Assistant Chief at the Laboratory of Molecular Virology, National Cancer Institute of the N.I.H. Dr. Hampar spoke on "Some New Concepts in Cancer Biology." Twenty-two table clinics were presented; five by graduate students and residents, nine by undergraduate students, and eight by dental hygienists. The quality was uniformly excellent.

Student coordinators for the Freshman Orientation Program were Esther Rubin and Steven Kornhaver.

Faculty speakers were Dean Formicola, Dr. Horowitz, Dr. Moreinis, and Dr. I. Mandel. Dr. Edgar Gattegno, president, represented the Alumni Association.

Completing the year's activities was a cocktail party held at the Greater New York Dental Meeting. Contributing to the success of this affair were Dr. Charles Solomon, Dr. Lichtenthal, Dr. William Jacobs, and senior student Richard Sadles.

Throughout the year there was very active participation in the Columbia Alumni Federation by the Dental Group. In December a candidate for Alumni Trustee (SDOS designee Dr. Joel Friedman) was presented the Medal for Conspicuous Service to the University on Commencement Day.

Strong recruitment of class representatives, and the establishment of an Alumni Development office with secretary, marked important achievements this year, and it is hoped that this will show its influence in the Medi-Center Campaign, annual giving and all other functions of the organization.

Students Prizes and Awards

General Awards of Achievement: Alpha Omega Fraternity Prize to Dr. Fred R. Leess; Psi Omega Award to Dr. Jonathan Roberts; Van Woert Award to Dr. Natalie A. Marchalonis; Ella Marie Ewell Medal to Dr. Lazarus Camesas.

Omicron Kappa Upsilon Keys (Honorary Dental Fraternity) presented to Drs. Fred R. Leess, Natalie A. Marchalonis, Jonathan Roberts, John L. Spochak, Laurence Sussman and Emanuel Tennebaum.

Divisional Awards of Excellence: Community Health to Dr. Peter M. Baracks; Endodontics to Dr. Salvatore M. Bonnano; Operative to Dr. Fred R. Leess; Oral Biology to Dr. Robert Tracey; Orofacial Growth and Development to Dr. Fred R. Leess; Oral Surgery to Dr. Laurence D. Sussman; Orthodontics to Dr. John L. Spochak; Pedodontics to Dr. Michael Switkes; The William Bailey Dunning Medal in Periodontics to Dr. Charles R. Avrutik; Preventive Dentistry to Dr. David S. Ehrenberg; The Rowe-Wiberg Medal in Prosthodontics to Dr. Steven E. Glickman; Stomatology to Dr. Jonathan Roberts.

Awards of Achievement: American Academy of Oral Medicine to Dr. Stewart K. Lazow; American Academy of Dental Radiology to Dr. Salvatore Napoli; American Academy of Periodontology to Dr. Claudia A. Hohn; American Academy of Oral Pathology to Dr. Claudia A. Hohn; American Association of Orthodontics to Dr. Ann Lee; American College of Dentists to Dr. Jonathan Roberts; American Dental Society of Anesthesiology to Dr. John L. Spochak; American Society of Dentistry for Children

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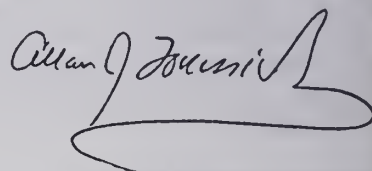
to Dr. Joseph C. Guliano and Dr. Ronnie Myers; International College of Dentists (U.S. SECTION) to Dr. Claudia A. Hohn; Society of Diplomates of the Board of Oral Surgery to Dr. Vincent P. Capasso; Dentists Supply Company Award to Dr. Stanley J. Weiss; Long Island Academy of Odontology to Dr. Peter M. Baracks; Arthur Merritt Award to Dr. Michael G. Molnar; C. V. Mosby Book Award to Dr. Robert E. Lewando; American Association of Endodontists to Dr. John F. Pati; Herbert J. Bartelstone Award to Dr. Richard J. Merzer; Italian Dental Society to Dr. Emmanuel J. Tennenbaum; American Academy of General Dentistry to Dr. John A. Nieskens.

Dental Hygiene Awards: F. J. Swanson Gold Medal to Ms. Arline Ginorio; Albert Stevenson Gold Medal to Ms. Susan Kocot; Clinical Proficiency Award to Ms. Charisse Altavilla; Philip J. Blackerby Award to Ms. Denise Fedel; Sigma Phi Alpha Keys (Honorary Dental Hygiene Society) presented to Ms. Wendy Ferguson, Ms. Sandra Picazio, Ms. Joan Barton.

Donors

The School of Dental and Oral Surgery wishes to express appreciation for contributions made in support of its programs by many individuals and organizations. Among the donors are: The Burroughs Corporation, Ms. Jessica Levy, Dr. Paul Tannenbaum, Virginia Hanna, The Miles Hodsdon Vernon Foun-

dation, The Orthodontic Alumni Society, Mr. Adolph Hirsch, The Goldman Sachs Fund, The Lewittes Foundation, The Sergei Zlinkoff Fund, The Stella and Charles Guttman Foundation, Herman H. Kahn, Dr. Martin Ames, Mr. Louis A. Ferris, Dr. Sidney Hurwitz, Dr. Mortimer Karmioli, The Petrie Stores, Inc., Dr. Edward Zerden, The Estate of John Jacobson, Alfred Golding, The American Fund for Dental Health, Herbert Hofmann, Dr. James M. Dunning, The Block Drug Company, Richard Lounsbury, Mr. Michael Francis, Dr. Herman Cantor, The Warner-Lambert Company, Colgate-Palmolive Company, Lifesavers, Inc., The William Rosenwald Family Fund, Dr. Jacob Abelson, Dr. Austin H. Kutscher, The Avon Products Foundation, Mr. Eagle, The Henry Kalman Foundation, Sylvester Matak, Mrs. Richard Pearman, Sir James Pearman, Mr. B. Culver, Jr., The Thermo-Jac Grove Company, Mrs. Ann Johnston, Mr. E. M. McClelland Johnston, The Reeves Teletype Corporation, Evelyn Williams, Eugene Williams, Dr. Clarence Furuya, Mrs. Grace S. Uriu, The Clara and Kurt Hellmuth Foundation, The Shendell Foundation, Mrs. Abe Vernikov, The Blythedale Children's Hospital, The Clarence and Anne Dillon Dunwalke Trust.



Allan J. Formicola, DDS
Dean

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Report of the Chairman of The Fund for MEDI/CENTER 1

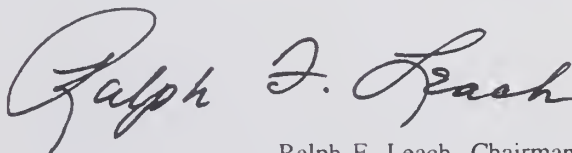
The past year has seen further progress toward the completion of the MEDI/CENTER 1 effort to raise \$133.75 million in capital funds for the Medical Center. In addition to the December 1979 total of \$108,826,084 in gifts, grants, and bequests, discussions have been underway on a number of large gifts we expect to be able to announce shortly.

As noted in the March 1979 *Progress Report Bulletin*, this success would not have been possible without the dedication and hard work of literally hundreds of volunteers who made up the MEDI/CENTER 1 organization. A list of their names, published in the *Bulletin*, numbered well over 550 and encompassed students, faculty, house staff, leaders of the business community, and representatives of the administrations of the two great institutions that make up this Medical Center. We are especially grateful for the outstanding example set by physicians, dentists, and scientists at the Medical Center, whose personal gifts totaled more than \$2 million, and who continue to identify new potential contributors to the Fund.

The wise counsel and active role of Mr. Harold H. Helm, as Chairman of the MEDI/CENTER 1 Executive Committee, have also contributed substantially to make 1979 a productive year.

I am pleased to report that CPMC Fund, Inc., the corporate entity that provided the vehicle for our capital campaign, has employed an Executive Director to expand the development and fund-raising capabilities of the internal organization. Robert Feldman, a deputy director with the Campaign for Yale, became Executive Director of CPMC Fund in July. He has since been joined by Robert G. Randall, also of the Yale campaign, now CPMC Fund's Deputy Director.

I am confident that the planning undertaken in the latter part of this year promises not only the successful completion of The Fund for MEDI/CENTER 1 in 1980, but also a variety of new activities in fund-raising on behalf of the Hospital and the Health Sciences Faculties.



Ralph F. Leach, Chairman

Reports of Departments and Services

Anatomy

MICHAEL D. GERSHON

Professor and Chairman

Major Departmental activities during the past year have included a successful search for a new Assistant Professor in the area of Neuroanatomy, an attempt to improve the quality of our graduate program, and participation with other departments in setting up a joint interdisciplinary course in Cell Biology. Several new graduate courses have been installed. One, in particular, required of all Anatomy graduate students, focuses on the critical appraisal of modern anatomical research, and serves to bring all our students together. We hope this will enhance their graduate training experience. The new course in Cell Biology will be directed by Karl Pfenninger and will begin in the Fall. This course is a major interdisciplinary undertaking and it is hoped that it will be a uniting factor for all of the graduate students on the Health Science Campus.

Problems faced by the Department now include a shortage of research space and overcrowding of several very important core facilities, due to expansion. Additional funds are being sought to ease the overcrowding, particularly of electron microscopes. A great deal of the Department's support is now provided by extramural research grants. This does reasonably reflect the effort of the staff; however, the projected cutback of NIH funding could make our position precarious.

Undergraduate Teaching

No major problems were encountered in the teaching program this year. Minor difficulties continue to impede the smooth integration of Histology and De-

velopmental Anatomy. An attempt to integrate the two courses was made again; however, it is difficult to integrate a 24-hour Developmental Anatomy course with a 100-hour Histology course. Either the shorter course must be excessively drawn out or the longer one must be interrupted. Last year Developmental Anatomy was excessively drawn out. This year Histology was interrupted. Next year we may have less integration so that the individual courses can run more smoothly.

We have also encountered some resistance from the Dental students in Histology. They seem to object to learning about the whole body. The male reproductive tract is cited especially by these students as objectionable. Additional effort will have to be made to impress upon the Dental students the utility of knowing about the entire body because of their important position as health care professionals.

Research

Dr. Michael Gershon is concentrating his research on the nervous system of the gut, the enteric nervous system, which is a portion of the Autonomic Nervous System. It was originally classified by Langley as a third autonomic division and, although this classification was forgotten for a long time, it is being revived today. Specific aims are threefold: (1) To study the cellular biology of one of the enteric neurons, the enteric serotonergic neuron, the existence of which has largely been determined in our laboratory. (2) To define the relationship of enteric serotonergic neurons to other neurons of the enteric nervous sys-

tem. (3) To examine the microenvironmental factors that are involved in regulating the development of the various types of enteric neuron.

Dr. April's biophysical studies continue to support the hypothesis that the A-band of striated muscle is a liquid crystalline structure. Low-angle x-ray diffraction studies, correlated with light microscopy and physiological techniques, produce data from which computer analysis provides information on the origins and magnitudes of the stabilizing forces within the A-band. Studies on single muscle fibers from which the sarcolemmae have been removed continue to provide information—in both the relaxed and rigor states—on the role of Donnan osmotic forces on lattice stability. In conjunction with Mr. Robert Aldoroty, (M.D./Ph.D. candidate), these studies are being extended to heart muscle. Dr. April has presented his concepts of the liquid-crystalline aspects of striated muscle at the Annual Meeting of the Biophysical Society and the Society for Cell Biology.

Dr. Richard Ambron is investigating the biogenesis of membrane glycoproteins and their distribution among the regions of a single identified neuron. Much of the work has focused on the giant neuron R2 of *Aplysia californica*. In collaboration with Drs. Lubit and Schwartz, an antibody to a specific vesicle glycoprotein has been obtained, and this will be used as an affinity label to examine the distribution of this component in the neuron. Work on the axonal transport of membrane glycoproteins with Dr. Goldberg, and on ^3H -polyamines with Dr. L. Kremzner has helped distinguish between material rapidly transported along axons and that moving by diffusion. Steve Rayport (Graduate Student) and Dr. Ambron are using a variety of techniques to identify and label R2's synapses and Dr. J. Ambron (on sabbatical leave from City University) is using lectins to map the topography of sugars on the surface of R2's soma. Dr. Ambron has received a Career Development Award and was presented with the "Golden Tooth" award by the dental class of 1982 as the outstanding teacher of the year.

Dr. Philip Brandt is working with skinned rabbit psoas single fibers to study the mechanisms for the regulation of tension and hydrolysis of ATP. This study is carried out in collaboration with members of the H. Houston Merritt Center for Muscle Disease (Drs. Kawai, Reuben and Sorenson of Neurology and Dr. Eastwood of Anatomy and Neurology). Our approach involves extensive use of computers to solve the multiple equilibria involved in the complex working solutions we employ, to control the actual mixing of the solutions by pumps and valves, and to collect and reduce the data. Our studies consider how a given model for tension regulation, for example,

will predict the shape and position of a pCa/tension curve. If the model fails to predict this accurately, a more complex model is developed and tested. If it predicts this data well other predictions are tested. In each stage of the processes new biochemical and physiological data is introduced. From these studies we will eventually determine the most probable mechanism which regulate muscle contractility. Frequently we compare diseased and healthy human muscle fibers (obtained at biopsy) with respect to a given function in order to learn more about the nature of the disease process.

Dr. Julia Currie has continued her research on the differentiation of the plasmalemma of neuroectodermal cells during neurulation using lectin-ferritin conjugates as specific ultrastructural markers for cell-surface carbohydrate moieties. Differences in the composition of the plasmalemma of neural crest and neural tube cells have been detected. In addition, the composition of the apical surface of these cells changes as neurulation proceeds. New studies, done *in vitro*, are aimed at elucidating the factors which determine the further differentiation of the plasmalemma of neural crest and neural tube derivatives.

Dr. Arline Deitch is Director of a Tissue Culture Core in a lung program project with Dr. Gerard Turino and has participated in collaborative studies on the *in vitro* production of connective tissue proteins and glycosaminoglycans. In addition, Dr. Deitch is Director of the Cancer Center's Cell Sorter Facility and has participated in projects involving cell cycle analysis with members of the Cancer Center.

Dr. Halina Den continued investigations of cell surface phenomena involved in myoblast fusion. Dr. Den specifically addressed herself to the question whether lectin-carbohydrate interactions are involved in this process. Surface labelling and ^{125}I -lectin-binding techniques were applied to intact myoblasts to determine if the previously described muscle lectin and its receptors are located on the surface of fusing myoblast. This should be the case if lectin-carbohydrate interactions are indeed involved in myoblast fusion. Preliminary results suggesting surface location of the lectin and its receptors are at present under investigation.

Dr. Cheryl Dreyfus is concentrating her research on the catecholaminergic (CA) neurons of the fetal mouse brainstem, explanted from the region of the *locus coeruleus*. Catecholaminergic neurons survive in organotypic tissue culture for up to 5 weeks. These neurons exhibit the glyoxylic acid induced histofluorescence (GIF) of CA, and their axons become radiographically labeled by ^3H -norepinephrine. In the past year factors which may be responsible for directing growth of these central neurites to various

targets have begun to be studied. A target of peripheral adrenergic neurons—the iris—has been shown to attract central CA neurons; therefore, patterns of neuritic outgrowth from explants of locus ceruleus were studied in co-culture with iris. The role of NGF in mediating iris-brainstem interactions was investigated, as well as the ability of iris to enhance growth of catecholaminergic (CA) neurites. When *locus ceruleus*, within brainstem explants, was co-cultured with iris for 2 days, cells grew out from the iris in all directions. Brainstem neurites also projected in all directions, but a substantial number preferentially grew toward the iris. By 4-7 days *in vitro*, iris cells partially surrounded the brainstem. Examination by glyoxylic acid-induced histofluorescence (GIF) revealed that by 7 days brainstem CA neurites projected heavily to cells of the iris outgrowth and often terminated on them; however, a few neurites also grew in the opposite direction, away from the iris. In contrast, although CA neurites from brainstem explants invaded and arborized within hippocampal explants no such dense projections were detected. Introduction of 1% anti-NGF had no effect on the neuritic outgrowth patterns in these brainstem-iris co-cultures. In other experiments, paired brainstem explants were grown for 8-16 days alone or with iris in co-culture. Uptake of ^3H -NE was used to evaluate quantitatively the CA neuritic growth. No difference was detected between the amount of uptake of ^3H -NE by brainstem cultures with or without iris. Thus, although CA brainstem neurites grow preferentially toward iris cells, this effect does not appear to be mediated by NGF nor by an iris-induced increase in CA neurites. In further studies, NGF's ability to enhance neuritic outgrowth was studied as well as its importance for the survival of these central CA neurons grown alone. No differences in neuritic outgrowth were detected between control brainstem cultures and their pairs grown with either NGF (up to 100 U/ml) or anti-NGF. Cultures were examined periodically while alive and then were exposed to glyoxylic acid and viewed for CA histofluorescence. A decrease in total neuritic outgrowth, as well as the CA component of the outgrowth revealed by GIF, was found in cultures exposed to 1000 U/ml of NGF. Uptake of ^3H -NE was used to evaluate quantitatively the CA neuritic outgrowth. No significant differences in uptake of ^3H -NE were found between control cultures and their pairs exposed to NGF (100 U/ml) or anti-NGF. Therefore, an effect of NGF on the directing of neurites to a target in co-culture or on the growth or maintenance of culture fetal central CA neurons was not detected. It appears that in this system, at least, other non-NGF growth factors must be

responsible for the development of neuritic networks in the brain.

Dr. Abraham Eastwood's research involves structure and function of muscle. He is studying the structure of chemically skinned mammalian skeletal muscle and morphological aspects of calcium regulation in chemically skinned fibers. Dr. Eastwood was invited to lecture about his research to the Department of Pharmacology and Experimental Therapeutics, University of Maryland.

Dr. Charles Ely is continuing a review of unpublished data related to the properties of antigonadotropic sera and to the effect of thyroidectomy on experimental ovarian tumors. He has written pilot chapters for a text presenting functional human anatomy in summary form. In courses given for medical students and dental hygienists and in the summer session, experiments in teaching human gross anatomy using the systemic approach and prosected material are in progress.

Dr. Alan Gintzler is concentrating on the neuronal systems that are involved in mediating acute responses to narcotics and is investigating those neuronal systems that subserve the long term effects of tolerance and dependence. The isolated enteric nervous system of the guinea pig is being used as a model system to study the CNS mechanism of action of opiates. The experimental approach utilizes ontogeny to simplify analysis of the enteric nervous system. This permits the study of the responses of a limited number of types of neuron to narcotics. Work during the previous year has shown that there is a distinct temporal or sequential order to the appearance of neuronal types: cholinergic and serotonergic neurons can be detected as early as embryonic (E) day 25, noradrenergic neurons cannot be detected until E48 and peptidergic neurons don't appear until after birth. Opiate receptors appear as early as E25, the earliest time that putative neuronal cell bodies can be detected in the electron microscope. Pharmacological responses to opiates (acute and tolerance/dependence) can be demonstrated at E56.

The following studies on the structure and function of the cat's auditory pathway have been carried out in Dr. James Kelly's laboratory: (1) Development of the central connections of the VIIIth nerve in the neonatal cat. These studies involve the injection of tritiated amino acids into the cochlea in an age-graded series of kittens to study the direct and transneuronal transport of labeled proteins. The results provide information about the factors controlling the synaptic organization of several brainstem nuclei involved with audition. (2) Laminar organization of the auditory cortex in the adult cat. These studies involve the use of

the peroxidase and radioautographic methods for studying neuronal connections. The cortical layers that give rise to callosal, association and cortico-fugal connections were determined. (3) Cortico-fugal projections of the auditory cortex. In this work, the radioautographic method was used to study the pattern of descending inputs from the auditory cortex to the inferior colliculus and to the medial geniculate body.

Dr. Daniel Linkie's laboratory has been active this year in the area of steroid hormone action. Specifically, their studies have involved the initial event of estrogen interaction with its receptor at the target cell level. We have utilized the immature rat extensively and have augmented our receptor studies with an examination of those serum factors which modulate the availability of steroid to an estrogen responsive tissue. Their investigations of serum albumin and alphafetoprotein have led them to postulate that these factors assume important physiologic roles but that their influence on receptor assay, *in vitro*, is quite variable. We also have been involved in studies of estrogen action via nonclassical receptor mediated steps, e.g., at the level of cell (neuronal) membranes.

Efforts have been initiated to study the dynamics of steroid receptor (estradiol and progesterone) levels and intracellular distributions in the pituitary in relation to the negative and positive phases of gonadotropin secretion. This work is coupled to an analysis of releasing hormone (GnRH) receptor changes and concentrations and should aid our understanding of pituitary biology. Additional ongoing studies involve estrogen and progesterone receptors in the endometrium and myometrium of the uterus and the oviducts of the human. We are focusing on possible age-related changes in the bioactivity of the specific receptor system and the intranuclear receptor-acceptor population.

Dr. Marie-France Maylie-Pfenninger's research is focused on the role of surface glycoconjugates in development. She studied the distribution of surface saccharides during the development of mouse preimplantation embryos, using ferritin-conjugated lectins as carbohydrate markers. She observed that plasmalemmal glycoconjugates are developmentally regulated during cleavage stages and blastocyst formation. This suggests that changes in surface glycoconjugate composition occur before the first morphologically detectable steps of differentiation appear in the embryo. Using the antibiotic tunicamycin which inhibits glycosylation of some glycoproteins she studied the importance of these glycoproteins during cleavage stages and blastocyst formation. She observed that addition of the drug during early development does not affect cleavage of the

embryos but prevents blastocyst formation. The role of surface glycoconjugates during preimplantation development was further studied using embryos from mutant mice whose development is arrested at the preimplantation stage. She found that in these mutant embryos the glycoconjugate composition of their plasma membranes is different from that of wild type embryos. She also observed that three teratocarcinoma cell lines that differ in their ability to differentiate also exhibit differences in lectin binding properties. In collaboration with Dr. James D. Jamieson (Yale University) Dr. Maylie-Pfenninger showed that differentiation of plasmalemmal glycoconjugates on acinar, endocrine and centro acinar cells from rat pancreas is temporally correlated with development and is unique for each cell type as indicated by lectin-ferritin binding. She could conclude from these studies that acinar, centroacinar and endocrine cells develop from a common progenitor cell(s) whose plasmalemmal carbohydrate composition resemble most closely that of the adult centro acinar cell. In collaboration with Drs. Michael Sarras and James D. Jamieson at Yale University, she observed that incubation of 15-day pancreatic rudiments with the glycosylation blocker tunicamycin for 4 days suppressed cytodifferentiation and altered pancreatic morphogenesis. In collaboration with Drs. Julia Currie and Karl Pfenninger, Dr. Maylie-Pfenninger studied the surface glycoconjugates of ectoderm, neural crest and future neural tube cells. In all these studies, the observations made consistently suggested that glycoconjugates play an important role in developmental processes.

Dr. Melvin Moss is studying the kinematics of cranial growth in space-time, in conjunction with the Bioengineering Institute, demonstrating the fundamental allometry of these processes. These were combined with other work on orthocephalization, permitting insight into the biodynamic processes causally related to the observed kinematic parameters.

Dr. Charles Noback's efforts in the past year were directed (1) to a study of protein-calorie undernutrition of rat pups reared by dams fed on a protein-deficient diet during the suckling stage, (2) to a project of some brain stem projections to the uvula of the cerebellum and (3) to completing a revision of his textbook with the medical illustrator Robert Demarest for 1980 publication. Dr. Noback was the invited speaker in the Multidisciplinary Symposium on Facial Pain (July, 1979) at Smuggler's Notch, Vermont sponsored by the Albert Einstein College of Medicine.

Dr. Eladio Nunez's main research objective continues to be the elucidation of essential characteristics

of parafollicular cells of the mammalian thyroid gland and to define as fully as possible how these neural crest-derived cells interact with follicular cells of the thyroid gland as well as with chief cells of the parathyroid gland. Studies from Dr. Nunez's laboratory have led to the postulation that serotonin, shown by Dr. Nunez to be produced and secreted by parafollicular cells, might act as a parafollicular cell to follicular cell messenger, activating cellular reabsorption of luminal colloid, thus leading to follicular cell secretion of thyroxine and triiodothyronine.

The research activities in Dr. Karl H. Pfenninger's laboratory continued to be focused on neuronal growth and differentiation, especially on the problems of membrane biogenesis and of cell surface specificity in neuronal recognition. The research can be summarized as follows:

- 1) Membrane biogenesis: the appearance of new lectin binding sites in specific zones of the plasma membrane of the growing neuron have been demonstrated unambiguously by Dr. K. Pfenninger. Autoradiographic tracing of the intracellular pathway of newly-synthesized phospholipid suggests the transport of a putative plasmalemmal precursor vesicle to these zones. The isolation by density gradient centrifugation of these vesicles is now in progress.

- 2) Membrane differentiation: This problem is studied in two systems, the regenerating olfactory nerve of the bullfrog and synaptogenesis *in vitro*. Dr. Rochelle Small (postdoctoral fellow) has demonstrated the stepwise appearance of different classes of intramembranous particles in the axolemma of the developing nerve. These morphological changes can be paralleled, at least in part, with functional changes of the membrane. In collaboration with Dr. G. Strichartz (SUNY, Stony Brook), we found that the young axolemma is very poor in sodium channels. Philip Simkowitz (graduate student) observed that, during synaptogenesis, the membrane of the developing nerve terminal changes its lectin binding properties, i.e., its glycoconjugate composition, in response to target contact. Synaptic membrane differentiation is also being investigated with modern immunological techniques by Dr. Ira Wallis (postdoctoral fellow) who is in the process of generating monoclonal antibodies to synaptic membrane proteins.

- 3) Surface specificity of the neuron: Dr. Pfenninger, in collaboration with Dr. Maylie-Pfenninger, completed the catalogue of lectin binding properties of different neurons. Each neuronal type was found to exhibit a specific carbohydrate signature on its surface. This may be of crucial importance to mechanisms of cellular recognition. Furthermore, it has been established that neural tube- and crest-derived

neurons fall into separate classes of lectin binding properties. Dr. Julia R. Currie, in collaboration with Dr. Maylie-Pfenninger, is investigating the origin of this dichotomy by studying lectin binding of ectoderm during neurulation. She found that differences in surface properties between surface ectodermal, crest, and future tube cells can already be detected very early, when the neural groove has just been formed. Furthermore, Dr. Currie succeeded in culturing differentiating neural tube and crest. This is an important technical achievement which will make it possible to study neuronal differentiation *in vitro*.

Dr. Taube Rothman's research has focused on autonomic development. She has found that developing autonomic neurons continue to divide even while they express mature phenotypic characteristics. Central nervous system neurons fail to do this, and their replication ceases when the cells acquire their mature phenotype. There thus appears to be a developmental difference between neurons of neural crest or neural tube origin. Additional research done by Dr. Rothman has involved the study of the developmental factors responsible for determining the direction of differentiation followed by neuronal precursors. Specifically, she is studying the role of the microenvironment in directing the choice of neurotransmitter made by enteric neurons in ontogeny. Working with organotypic tissue cultures she has shown that undifferentiated neuronal primordia from the neural crest colonize the primitive gut during ontogeny and differentiate within the enteric microenvironment. Further work will involve an analysis of the responsible parameters.

Dr. Ann-Judith Silverman has been involved with the following major areas of research on the neuroendocrine neurons of the hypothalamus: (1) analysis of the afferent input to the paraventricular nucleus using HRP tracing; (2) analysis of the LHRH neuronal networks involved in regulation of cyclic gonadotropin release; (3) description of the ontogeny of the LHRH neuron in the fetal guinea pig including discovery of a new LHRH containing neuronal group: the *nervus terminalis*; (4) description of the ontogeny of neurophysin in the mouse including onset of peptide biosynthesis, axonal outgrowth, synaptogenesis and dendritogenesis; (5) elucidation of the site and mechanism of adrenal steroid feedback on paraventricular neurons; (6) analysis of neural circuitry involved in circadian rhythms, especially as they relate to reproduction. Additional projects have included: (1) analysis of serotonin concentrating gonadotrophs in the anterior pituitary (with Drs. Nunez and Gershon); (2) localization of glia in *Aplysia* ganglion (with Dr. Ambron); (3) distribution of Substance P

and 5-HT in the gut (with Drs. Gershon and Kupsky); and (4) initial studies on catecholamine innervation of vasopressin neurons (with Dr. Dreyfus).

Dr. Virginia Tennyson is continuing to investigate the effects of reserpine on the nervous system of pregnant rabbits and their fetuses. She has found lesions in the brain of the rabbit and its fetuses after chronic reserpine administration. Counts of axonal terminals in a large number of electron micrographs indicate that there are fewer axonal boutons in the putamen of the reserpine-treated fetuses than in controls. She has found a decrease in dopamine fluorescence in experimental fetuses, and she is currently doing biochemical studies to confirm of dopamine uptake that this is due to axonal loss.

Dr. Elizabeth Thompson has continued to apply special marking techniques to study identified neurons in *Aplysia*, in order to gain insights into the ultrastructural correlates of neuronal function. In collaboration with Dr. James Schwartz, she has found

that the peaks of rapidly transported glycoproteins or serotonin found along the axons of identified neurons after intrasomatic injection of radioactively labeled material cannot be accounted for either by local variations in volume or in surface area. In collaborations with Drs. Craig Bailey, Vincent Castellucci and Eric Kandel she has found that a principal motor neuron of the gill withdrawal reflex (cell L7) exhibits a previously undescribed plate-like postsynaptic specialization. It also forms synaptic contacts with muscle cells in the sheath of the abdominal ganglion, and some of its processes are in close contact with blood sinuses of the sheath, raising the possibility that this neuron may be a sensory-motor cell with a role in regulation of blood flow to the central nervous system. In addition, in collaboration with Drs. John Koester and Eli Shapiro, she has studied the structure of neuromuscular junctions within the aortic constrictor muscle of *Aplysia*.

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Anesthesiology

HENRIK H. BENDIXEN

Professor and Chairman • Director of Service

The Department of Anesthesiology continues to gradually broaden its activities. The clinical activities are being expanded and improved where possible, and we are devoting considerable effort to evaluating the impact of technology in the clinical setting of our specialty. Our resident training program is attracting excellent candidates and we are striving to improve the program to be able to continue to do so. Medical student teaching has been reorganized and considerably improved, and new obligations have been assumed. Research activities are in the process of reorganization and reevaluation, and we are beginning to see some benefits of this effort.

In the department's administration Dr. Shih-Hsun Ngai remains responsible for research and research training, Dr. Eugene J. Pantuck for recruitment and education of residents, Dr. Kevin Sanborn for medical student training, Dr. Marcelle Willock for training in cardiopulmonary resuscitation and Dr. Donald C. Brody for coordination of clinical activities of the service at the Presbyterian Hospital. Dr. Edgar C. Hanks is the elected treasurer and Dr. Carolyn Greenberg the elected secretary of the department. Dr. Mieczyslaw Finster is the elected chairman of the management committee of the service.

Training and Teaching

We have modified our didactic programs and clinical rotations to further strengthen the residency training program. We continue to carry out in-service evaluation of trainees and to participate in the in-training examination given under the auspices of the American Board of Anesthesiology.

Our approach to clinical service emphasizes the training of residents to head anesthetic teams, not just to perform solo practice. As part of the team concept we promote reliance on all appropriate manpower categories. At the Presbyterian Hospital we have incorporated certified nurse anesthetists and monitoring technicians into anesthetic teams headed by the physician-anesthesiologists.

We continue to emphasize the management of the critically ill patient, not only in the operating room but also in intensive care units and recovery rooms.

We continue to welcome house staff from other services on elective rotations through the anesthesiology service at the Presbyterian Hospital.

Our didactic seminars have been reorganized into blocks of related topics, and the series has been designed to provide over a two year period a fairly comprehensive survey of the basic scientific and clinical concepts that underlie anesthesiology. The weekly case conferences and lectures continue. Both our lectures and seminars have been approved for credit in Category I towards the Physicians Recognition Award of the American Medical Association, and the case conferences and the nurse anesthetist seminar series have received approval from the American Association of Nurse Anesthetists for continuing education credit.

Our department is now teaching a course in basic cardiopulmonary resuscitation to members of the first year class. The course complies with the guidelines of the American Heart Association and of the Joint Commission on Accreditation of Hospitals by assuring that the medical students will be competent in

basic life support when they begin their clinical clerkships. The department has reorganized the third year clerkship for improved utilization of students' time, at the same time expanding both clinical and didactic instruction. Students without previous experience in basic life support are given the opportunity to learn these skills during the clinical clerkship.

Our fourth year elective in clinical anesthesiology has been reorganized and strengthened. We also continue to offer a fourth year elective in intensive care, jointly with the department of surgery. Both of these electives have become increasingly popular with the students and are largely oversubscribed.

The department has been very pleased to lend its support to the School of Nurse Anesthesia at the Roosevelt Hospital. A Master's Program in nurse anesthesia has been initiated this year under the auspices of the Columbia University School of Nursing.

Research and Research Training

During the past year we have seen the termination of the Anesthesiology Center Grant from the National Institute of General Medical Sciences and the beginning of the reorganization of research support, relying largely on individual project grants, contracts and certain program project grants from the National Institutes of Health. We have also had research support from the following sources: The Whitehall Foundation, The National Foundation, Hoffmann-La Roche, Inc., The Nahas Foundation, The National Institute on Drug Abuse, The Alcoa Foundation, The Helen Clay Frick Foundation, The American Society of Anesthesiologists (The Parker B. Francis Foundation).

We continue to enjoy collaboration with other departments and other institutions including the Departments of Pediatrics, Pharmacology, Physiology, Psychiatry, Surgery, Obstetrics and Gynecology, the Department of Biostatistics of the School of Public Health, the Roche Laboratories, the Roche Institute of Molecular Biology, the Laboratory of Preclinical Pharmacology at the National Institute of Mental Health, The Rockefeller University and the Pennwalt Corporation.

Drs. Ngai and A. Donald Finck have studied the effect of nitrous oxide in the concentration of enkephalin-like substance in the whole brain in rats, using the opium receptor binding assay. The same investigators have also studied the mechanism of analgesic action of ketamine, finding support for the view that ketamine induces analgesia by a direct action on the opiate receptors. During sabbatical leave at the Roche Institute of Molecular Biology, Dr. Ngai is studying the effect of hypoxia on cir-

culatory parameters and plasma catecholamine concentrations in unanesthetized, free-moving rats.

Dr. Joseph C. S. Yang is collaborating with Dr. W. Crawford Clark (Psychiatry) in studying the antagonism of nitrous oxide analgesia by naloxone in man, and has found that naloxone significantly decreases the analgesia produced by breathing thirty-three percent nitrous oxide. The same investigators have also examined the effects of cocaine of the sphenopalatine ganglion on experimental ischemic pain in fifteen healthy male subjects.

Drs. Lubos Triner, Yvonne Vulliemoz, Yakub Gangat, Sook Young Woo and Keith Bernstein, and Mariagnes Verosky, Research Associate, have continued their investigations of the actions of volatile anesthetics and adjuvant drugs on the cyclic nucleotide systems in myocardium and in different areas of the brain. Dr. Bernstein has found dobutamine, a recently developed congener of dopamine, to have properties characteristic of a beta-adrenergic agonist, with a lower affinity than isoproterenol for the myocardial beta receptor and a lower intrinsic activity on adenylate cyclase. He also found that halothane does not alter the responsiveness of adenylate cyclase to beta antagonists in a partially purified canine myocardial membrane preparation as it does in the whole homogenate. Experiments on halothane's action on adenylate cyclase in various areas of myocardium and brain showed that the action of the anesthetic is not mediated by calcium. Another series of experiments suggested the effect of halothane and enflurane on cyclic 3',5'-guanosine monophosphate content of cerebellar cortex may be related to a specific anticonvulsant action of these agents.

Dr. Richard S. Matteo, working with Drs. Hoshang J. Khambatta and William Brotherton, studied in man the pharmacodynamics of the nondepolarizing muscle relaxant, metocurine, and the effects of renal failure on the disposition and action of metocurine. Studies on the effects of extracorporeal circulation on the pharmacokinetics of nondepolarizing muscle relaxants in man are in progress. Dr. Matteo has also collaborated with Dr. Jeevendra Martyn of the Massachusetts General Hospital, Harvard University, in an investigation of the dosage requirements of muscle relaxants in severely burned patients. These patients require a larger dose of muscle relaxant than the normal patient probably because of increased serum protein binding of the drug.

Dr. Pantuck has continued to collaborate with Dr. Allan H. Conney of Hoffmann-La Roche, Inc. in studies on the role of environmental factors in the regulation of drug and carcinogen metabolism.

Dr. Leila Mei Pang continues to work with Drs.

Robert B. Mellins and S. Alex Stalcup (Pediatrics) and with Drs. Barbara Meyrick and Lynne Reid (Children's Hospital, Boston) on the effect of exogenous corticosteroids on pulmonary vascular bed development in the premature fetal rabbit. Other studies have involved the effect of exogenous bradykinin on pulmonary hemodynamics and fluid and protein exchange in the lungs and the modulating effect of acute hypoxia on kinin-induced alterations of fluid and protein permeability and hemodynamics in the lung. In collaboration with Dr. Hugh M. O'Brodovich (Pediatrics) and Drs. Stalcup and Mellins (Pediatrics), Dr. Pang has examined the effect of stimulating the kallikrein-kinin system by hypercapnic acidosis.

The Division of Perinatal Medicine, under the direction of Dr. L. Stanley James, has been awarded a Major Research Program to provide better methods for the prediction and assessment of fetal hypoxia, to investigate the mechanisms of fetal heart rate variations to determine whether maternal smoking causes fetal hypoxia, and to determine the ways in which maternal smoking adversely affects the fetus. The studies of the effect of hypoxia and smoking on the fetus are under way and parallel observations are being made in both the human and chronically instrumented nonhuman fetus in which direct measurements of biochemical and biophysical parameters can be made.

Dr. Raymond B. Stark (Pediatrics), in collaboration with Dr. Salha Daniel, Dr. Kazim Husain (Medicine) and Dr. Raymond Vande Wiele (Obstetrics and Gynecology) are investigating the process of activation of fetal anterior and posterior pituitary response to hypoxia. Dr. Daniel, in collaboration with Drs. Stark and James, is examining the role of the kidney in the homeostatic responses of the fetus during interuterine and perinatal periods. These experiments have shown that in response to hypoxic stress, plasma levels of norepinephrine and vasopressin increase and there is a rise in renin activity. Dr. Jen Tien Wung, in collaboration with Drs. John Driscoll and Ann Koons (Pediatrics) and Dr. James, has studied the changing incidence of bronchopulmonary dysplasia, finding that in recent years there has been a marked fall in the incidence of this complication. The same group is also evaluating the feasibility of transcutaneous CO₂ partial pressure monitoring at the neonatal intensive care unit. The effect on pulmonary mechanics of the newborn infant on the insertion of a chest tube is also being studied by this team.

Drs. Hisayo Morishima, Finster, Hilda Pedersen, K. Sakuma (Pediatrics) and Benjamin G. Covino (Peter Bent Brigham Hospital, Boston), continue their study of pharmacokinetics and toxicity of local

anesthetics in the fetal newborn and adult sheep and baboon. The results indicate that tissue uptake and toxicity of these drugs are enhanced in the presence of acidosis and hypoxemia. The same team has investigated the potential benefits and risk for the fetus associated with drug therapy to alleviate pain and agitation of the mother. This group has also started a collaboration with Dr. Charles E. Pippinger (neuropharmacology) to investigate the factors governing placental transfer and fetal uptake of narcotics, using a chronic sheep preparation.

Dr. Gabriel G. Nahas, working with Drs. Colette Leger and Bernard Desoize (Institute of Toxicology, Paris, France) and Dr. Akira Morishima (Pediatrics), is studying the effect of benzodiazepines, butyrophenones, phenobarbital and methadone on DNA synthesis in cultured lymphocytes by inhibiting membrane transport of thymidine. In cooperation with Dr. David Cozens (Huntingdon Laboratories, England), Dr. Nahas is also studying the toxicity of *cannabis* extract, and he continues his investigation on the effect of different cannabinoids on the reproductive function of rodents in collaboration with Drs. Wylie Hembree and Hosea Huang (Obstetrics and Gynecology).

Dr. J. Gilbert Stone has been working with Drs. Paul Hoar (University of California, San Francisco), Alber Faltas and John Calabro in studies of the effects of afterload reduction and preload augmentation during anesthesia and surgery in patients with intraoperative cardiac failure. Working with Dr. Khambatta, Dr. Stone has studied the effects of induced hypotension on plasma renin activity and catecholamine level, finding sustained high levels of plasma renin activity during induced hypotension. This is thought to be the cause of the blood pressure overshoot which follows discontinuation of the induced hypotension. Pretreatment with propranolol attenuates this overshoot.

Drs. Ralph A. Epstein, Mary Anne Epstein (Chemical Engineering), Warren K. Grodin and Peter R. Fletcher, with Drs. G. G. Haddad and R. B. Mellins (Pediatrics) have collaborated in a number of research activities. The analysis of cardiorespiratory control systems in infancy is an ongoing study involving Drs. Epstein, Epstein, Mellins, Haddad and Grodin. Drs. Epstein and Epstein have concentrated on mathematical models of flow patterns during mechanical ventilation and on problems related to sampling of end tidal gases. Drs. R. A. Epstein and Grodin have been studying the interaction of anesthetics with carbon dioxide absorbents, and Drs. Epstein, Epstein and Fletcher have launched a theoretical and experimental study of high frequency mechanical ventilation.

Drs. Jeffrey Askanazi, Allen I. Hyman, Stanley H. Rosenbaum and Lee M. Rosenbaum have continued to collaborate with Dr. John M. Kinney (Surgery) in studies of ventilatory patterns in normal subjects and acutely ill patients, using a noninvasive canopy system which yields information unobtainable by analysis of classic respiratory parameters. These studies have shown that the administration of total parenteral nutrition utilizing glucose as the entire source of non-protein calories is associated with large increases in carbon dioxide production through the combination of oxidation and lipogenesis and in patients with borderline pulmonary reserve can precipitate respiratory distress. The same group has initiated studies of respiratory function and breathing pattern in patients with muscle weakness in collaboration with Dr. Norma M. T. W. Braun (Medicine).

Other studies, in collaboration with Drs. Kinney, David H. Elwyn (Surgery), Christopher B. Michelsen (Orthopedic Surgery) and Peter Furst (Karolinska Institute, Stockholm, Sweden) have revealed that characteristic changes in muscle free amino acid occur following trauma. Nutritional intake under these circumstances can exert only minimal influences. With major sepsis, changes are qualitatively similar but quantitatively more magnified than following uncomplicated injury. With increasing severity of injury there appears to be progressive depletion of muscle high energy phosphates. There appears to be a salutary effect of glucose intake in maintaining postoperative levels of ATP in muscles at a normal value. Dr. Askanazi, working with Drs. Elwyn and Frank E. Gump (Surgery), has undertaken studies of substrate kinetics in regional metabolism in the presence of injury and sepsis, showing that fat appears to be utilized preferentially as an energy source even when there is an adequate supply of glucose available.

Drs. Richard Chen and Foun-Chung Fan, working with Dr. Shu Chien (Physiology), have been investigating the shunting of microspheres in different vascular beds, as well as regional blood flow distribution in hemorrhagic shock experiments, with a special interest in the cerebral circulation. The same group has also undertaken clinical studies of the effect of induced hypotension on heart rate response to blood pressure change as well as circulatory adjustment following the occlusion of carotid arteries during carotid endarterectomy.

Honors

Dr. Henrik H. Bendixen gave the annual Horace Wells Oration to the New England Society of Anesthesiologists, participated in a symposium on the occasion of the 500th anniversary of the University of

Copenhagen, and lectured at the Universities of Odense and Copenhagen.

Dr. Louis S. Blancato, Director of the Anesthesiology Service at St. Luke's Hospital, has been elected first vice president of the American Society of Anesthesiologists. Dr. Ennio Gallozzi, Assistant Director of the Department at St. Luke's Hospital, participated in a symposium on surgery in the urological patient in Fiuggi, Italy.

Dr. Herbert G. Cave, Director of the Anesthesiology Service at Harlem Hospital, served on the Board of Directors of the New York County Health Services Review Organization and also on the Advisory Committee to Urban Systems Research and Engineering, Inc. Dr. Cave is also director of a tutorial program of Westchester County and, in addition, serves as Chairman of the Board of the Westchester Community Opportunity Program, Inc., an anti-poverty agency.

Dr. Ronald Andree, Director of the Anesthesiology Service at Roosevelt Hospital, continues as medical director for the program in respiratory therapy at the Borough of Manhattan Community College. He is also a member of the Professional Liability and Defense Board of the New York State Society of Medicine and a member of the Medical Insurance Subcommittee of the New York County Medical Society. He is on the Respiratory Therapy Subcommittee of the New York State Society of Anesthesiologists and the Respiratory Services Committee of the New York Lung Association.

Dr. S. H. Ngai is an executive director of the American Bureau of Medical Advancement in China, Inc., a consultant to the Division of Research Grants, National Institutes of Health, and a member of the Subcommittee for Continuing Medical Education of the American Society for Pharmacology and Experimental Therapeutics. He is also a member of the Subcommittee on Metabolism and Regulation, American Society of Anesthesiologists. He delivered the First Frederick H. Van Bergen Lecture sponsored by the Department of Anesthesiology, University of Minnesota. He was visiting professor at the State University of New York, Syracuse.

Dr. A. Donald Finck was an invited lecturer at the Annual Meeting of the American Society of Anesthesiology, speaking on opiate receptors and endorphins. Dr. Finck is also 1972 class chairman of the P & S Alumni Association.

Dr. Lester C. Mark is a member of the executive committee of the Foundation of Thanatology. He was also program chairman of the 7th Seminar and Workshop in Acupuncture and Pain Control held in New York City under the joint sponsorship of the New York Society of Acupuncture, the American

College of Acupuncture and the American Academy of Acupuncture.

Dr. Leonard Brand is a member of the New York Society of Anesthesiologists' Committee on Membership and Credentials, and is a consultant in anesthesiology to the Veterans Administration Hospital in East Orange, New Jersey. He has lectured at the University of Ljubljana, Yugoslavia and at the Congress on Clinical Therapeutic Aspects of Pain and Rehabilitation in Salsomaggiore, Italy.

Dr. Marcelle Willock is vice president of the Women's Medical Association of New York City, vice chairman of the Regional Emergency Medical Services Council of New York City, president and alternate director of District 2 of the New York Society of Anesthesiologists and also chairman of its Committee on Public Relations, member of its Editorial Board and member of its Committee on Civil Defense. She has also served as course director for advanced cardiac life support courses held at the Columbia-Presbyterian Medical Center and at other institutions.

Dr. Keith Bernstein was awarded first prize in the Current Research by New Investigators competition at the Postgraduate Assembly of the New York State Society of Anesthesiologists.

Dr. Leila Mei Pang is a member of the Program Committee of the Pediatric Assembly of the American Thoracic Society and a member of the Research Review Committee of the American Thoracic Society/American Lung Association.

Dr. Mieczyslaw Finster is a member of the Committee on Obstetrical Anesthesia of the American Society of Anesthesiologists and he lectured at the First International Symposium on Perinatal Medicine in West Berlin. He also lectured to the Austrian Society of Anesthesiologists in Vienna.

Dr. Gabriel Nahas has lectured to the Department of Pharmacology at the University of Oxford, to the European Postgraduate Conference in Anesthesia in Paris, at the Huntingdon Research Center in Huntingdon, England, and at the Entretien de Bichat in Paris.

Dr. Gerald Weinberger is the secretary of the New York State Society of Anesthesiologists, chairman of its Committee on Bylaws and business manager of its Postgraduate Assembly. He is also a delegate to the American Society of Anesthesiologists and a member of the Grievance Subcommittee of the Medical Society of the County of New York.

Dr. Jacob S. Israel is a member of the Joint Review Committee for Respiratory Therapy Education, the chairman of the Committee on Anesthesia Care Team Education of the American Society of Anesthesiologists and a member of the Program Commit-

tee of the Postgraduate Assembly of the New York State Society of Anesthesiologists.

Dr. Allen I. Hyman was visiting professor at the University of Pennsylvania, Philadelphia, where he lectured at the Dripps Memorial Conference.

Patient Care

The Presbyterian Hospital

The Anesthesiology Service attended 21,118 patients in 1979. General anesthesia was administered to 15,402 patients and regional anesthesia to 1,951. Consultations for resuscitation, diagnostic and therapeutic nerve blocks and respiratory care were provided for inpatients and outpatients. The Service continues the joint operation with the Department of Surgery of the Surgery/Anesthesiology Intensive Care Unit. During the year, 589 patients were treated in this unit.

The Respiratory Therapy Service treated 13,557 patients in 1979; 1,851 patients received mechanical ventilation for a total of 6,202 patient days.

Harlem Hospital

The Anesthesiology Service attended 5,834 patients in 1979. General anesthesia was administered to 2,623 patients and regional anesthesia to 949. Consultations for resuscitation, diagnostic and therapeutic nerve blocks and inhalation therapy service and respiratory care were provided for inpatients and outpatients. The school for training of nurse anesthetists continues to function successfully.

The Roosevelt Hospital

In 1979, 9,232 patients were attended. General anesthesia was administered to 7600 patients and regional anesthesia to 386. Consultations for resuscitation, diagnostic and therapeutic nerve blocks and respiratory care were provided for inpatients and outpatients.

St. Luke's Hospital

The Service attended 10,031 patients in 1979. General anesthesia was administered to 9,309 patients and regional anesthesia to 722. Consultations for resuscitation, diagnostic and therapeutic nerve blocks and respiratory care were provided for inpatients and outpatients.

Mary Imogene Bassett Hospital

1,918 patients were attended by the Anesthesiology Service. General anesthesia was administered to 1,551 patients and regional anesthesia to 367. Consultations for resuscitation, diagnostic and therapeutic

tic nerve blocks and respiratory care were provided for inpatients and outpatients.

Overlook Hospital

The Anesthesiology Service attended 12,000 pa-

tients in 1979. General anesthesia was administered to 9,000 and regional anesthesia to 3,000. Consultations for resuscitation, diagnostic and therapeutic nerve blocks and respiratory care were provided for inpatients and outpatients.

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Biochemistry

ISIDORE S. EDELMAN

Robert Wood Johnson Jr. Professor and Chairman

The rebuilding of the Department of Biochemistry is proceeding vigorously. In the past year, five new faculty members have been recruited from outstanding biochemical centers both in the United States and abroad. Three of the new Faculty are now in residence: Dr. James L. Roberts, an expert in molecular biology and in particular in the regulation of the expression of genes coding for neuropeptides, joined the Department in May. Drs. Kamil Ugurbil and Bonnie A. Wallace, began their tenures in September. Dr. Ugurbil has pioneered in the use of high resolution NMR in the analysis of metabolic pathways, *in vivo*, and of protein conformations. Dr. Wallace has skillfully applied a variety of advanced physical techniques to the elucidation of the structural determinants of membrane functions.

This summer, two more Faculty members will join P & S: Dr. Lee Makowski uses low angle X-ray diffraction and electron microscopy in the delineation of the structures of viruses and membranes with great effectiveness. Dr. Roger M. Burnett has made important progress in the definition of the structure of the adenovirus capsid and is an expert in X-ray crystallography and low angle X-ray diffraction.

Research

Using the technique of DNA-mediated gene transfer, Dr. Richard Axel's laboratory have stably transferred a number of genes coding for selectable biochemical functions such as thymidine kinase to mutant mouse cells. The isolation of cells transformed with genes which do not code for selectable

markers, however, is problematic, since current transformation procedures are highly inefficient. Recently, they have demonstrated the feasibility of co-transforming cells with two physically unlinked genes. Co-transformed cells can be identified and isolated when one of these genes codes for a selectable marker. They have used the viral tk-gene as a selectable marker to isolate cell lines which contain the tk gene along with either bacteriophage ϕ X174, plasmid pBR322, or the cloned rabbit β -globin gene sequences stably integrated into cellular DNA. They have further demonstrated that the gene coding for the rabbit β -globin in transformed mouse fibroblasts is properly recognized by the transcriptional and processing enzymes of the mouse cell to generate RNA indistinguishable from the mature globin mRNA of the rabbit erythroblast. These studies demonstrate the value of co-transformation systems in the analysis of eukaryotic gene expression.

Drs. Ruth and Reinhold Benesch continued their investigations on the polymerization of sickle hemoglobin. Using double mutant hemoglobins, some α chain mutations were found to inhibit and others to enhance gelation. These results were complemented by electron microscopic studies on the fibers of these hemoglobins in collaboration with Dr. Stuart Edelstein at Cornell University. A new reagent for coupling hemoglobin with a deuterated label was also introduced. The new method for antisickling agents which measures oxygen affinity and minimum gelling concentrations at the same time was extended to several new compounds. Rohinton Edalji and

Suzanna Kwong participated in these projects. A Citation Classic on the original discovery of the effect of 2,3-diphosphoglycerate on oxygen transport was contributed by invitation to Current Contents/Life Sciences.

The Laboratory of Dr. Isidore S. Edelman has three main problems under study: purification of steroid receptors, cell and molecular biology of thyroidal regulation of active Na^+ transport, and the regulation of apical membrane Na^+ permeability by aldosterone. These problems all concern hormonal regulation of membrane transport processes. Purification of glucocorticoid receptors is being attempted by combining DNA-cellulose chromatography and antibody affinity chromatography. The generation of antibodies is being explored by the hybridoma (fusion of immunized mouse spleen cells with mouse myeloma cells) technique. Cell biology of thyroid hormone action is under study in three isolated cell systems (myoblasts, fibroblasts, and proximal renal tubular fragments). In addition, isolation and purification of the mRNAs coding for the subunits of the Na^+ pump is being pursued as an approach to the role of induction of these mRNAs in the action of thyroid hormone. Analysis of aldosterone regulation of apical Na^+ permeability centers on covalent labeling (^{125}I) of the apex of toad bladder epithelium, purification of this membrane, and resolution of the constituent proteins by two-dimensional gel electrophoresis.

Dr. Max A. Eisenberg is continuing his studies on the regulation of the biotin operon which is divergently transcribed. The repressor has been extensively purified. His filter-binding assay has provided proof for the corepressor role of biotinyl-AMP rather than biotin. The purified repressor preparation possesses both repressor and biotin activating activities which seem to copurify. Studies with the biotin analog α -dehydrobiotin which acts as a corepressor *in vivo*, indicate it can also be activated by the repressor preparation and acts as an antagonist for biotin activation at high concentrations. The *in vitro* repression with α -dehydrobiotin system was found to be dependent on repressor concentration.

Dr. Philip Feigelson's laboratory has continued to explore the biochemical mechanisms underlying the multi-hormonal control of $\alpha 2\text{u}$ globulin synthesis in rat liver. It was shown that androgens, glucocorticoids and thyroid hormone regulate the transcriptive synthesis and cellular level of $\alpha 2\text{u}$ globulin mRNA. Growth hormone on the other hand, acts translationally to regulate the intracellular translocation of $\alpha 2\text{u}$ globulin mRNA to the rough endoplasmic reticulum where it was utilized for the synthesis of $\alpha 2\text{u}$ globulin. Recently the $\alpha 2\text{u}$ globulin cDNA was integrated

into plasmid pBR322 enabling its transfection, culture and replication in *E. coli* X7792. A 535 base pair Ava II restriction fragment has been isolated from this plasmid which contains a 310 base pair sequence of $\alpha 2\text{u}$ globulin coding DNA. This Ava II fragment, after being rendered radioactive by nick translation, has been utilized to quantitate $\alpha 2\text{u}$ globulin RNA sequences by hybridization and is being used as a molecular probe for Southern analysis of $\alpha 2\text{u}$ globulin gene structure.

Dr. Allen M. Gold continues his work on the interactions between glycogen, a highly branched animal starch, and enzymes that act directly upon it. Kinetic studies of glycogen synthase are in progress. A program of investigating the isolation and properties of glycogen branching enzyme and its possible role in certain diseases is being carried on in collaboration with Dr. Carola Ponzetto Zimmerman, on leave from the University of Turin.

Dr. Dezider Grunberger and his coworkers have studied structural and functional damage in DNA induced by chemical carcinogens. They have established that benzo[a]pyrene diol epoxide binds in plasmid DNA to exocyclic amino groups in in guanosine, adenosine, and cytidine residues. Restriction enzyme analysis of modified DNA showed random distribution of the carcinogen. With increasing extents of modification, the transfectional function of a modified plasmid DNA was inhibited. In a *Salmonella typhimurium* mutagenesis assay system, when microsomal activation enzymes are used, the DNA-benzo[a]pyrene diol epoxide adducts formed, resemble that seen in intact mammalian cells. In collaboration with Dr. B. Singer, it was demonstrated that alkylated uridines or cytidines which are products of alkylating carcinogens acting on nucleic acids have changed base-pairing properties which are considered to be mutagenic. In the area of tRNA, evidence has been presented that lysine is involved in the biosynthesis of the hypermodified Y base in phenylalanine-tRNA of Vero cells.

Dr. Richard Hochberg's laboratory has found a new chemical class of estrogen derivatives that are biosynthesized by estrogen target organs of the rat and by human breast tumors. This class of compounds is very nonpolar and has been isolated and separated into five distinct compounds. Dr. Hochberg has also synthesized iodine-labelled derivatives of estrogen and estradiol that bind specifically and with high affinity to the estrogen receptor. This compound is vastly simplifying the assay of estrogen receptors in human breast cancer. The same compound has been synthesized with the isotope ^{131}I and it has been used to image estrogen target organs with a gamma camera. It is possible that this agent

may be useful for the detection and treatment of estrogen receptor-containing breast cancers.

The research in the laboratory of Dr. Arthur Karlin on the molecular properties of acetylcholine receptors continued. Dr. Vinayak Damle has demonstrated a profound change in receptor conformation upon its binding of agonists but not antagonists. Dr. Susan Hamilton found that a major component of receptor-rich membrane resembles actin and may be involved in receptor localization. Mr. Rashad-Rudolph Kaldany has found that a covalently reacting fluorescent reagent may label a local anesthetic binding site in receptor-rich membrane. Dr. David Wise has determined the shape of the receptor by neutron scattering and electron microscopic analysis.

Professor Alvin I. Krasna's laboratory has continued the development of biological and synthetic systems for the cleavage of water by solar energy to form hydrogen and oxygen. Hydrogen is an ideal clean fuel and its production from water and sunlight would ease the energy problem. The laboratory has also been studying the regulation of the enzyme hydrogenase in microorganisms and is seeking to isolate mutant forms of the enzyme.

The laboratory of reproductive biochemistry, headed by Dr. Seymour Lieberman, is engaged in three facets of steroid hormone biochemistry. One involves efforts to obtain further evidence that steroidogenic processes are catalyzed by multi-enzyme complexes. Another concerns the nature and function of the lipoidal derivatives of steroids that occur in steroidogenic tissues. The third is concerned with the pathways of estrogen biosynthesis that exist in the placenta.

Professor Barbara W. Low and her colleagues have continued their studies of postsynaptic curaremimetic neurotoxins from the venoms of both land and sea snakes. With Dr. Martha R. Kimball, the principal features of the reactive site have been re-examined and a probable hydrophobic cleft region also described. Recent studies led to the crystallization of toxins hitherto uncrystallizable. The work on this project has been extended to structure studies of the homologous cardiotoxins and cytotoxins from snake venoms. The collaborative study of Dr. Low with Dr. Leslie L. Lessinger, Assistant Professor, Barnard College, of the crystal structure of some bile acids, bile acid degradation products and complexes of the former with carcinogens continues. This is one aspect of the overall study of the etiology of colorectal carcinoma which continues.

Dr. M. M. Rapport, in collaboration with Dr. S. Karpiak, has continued studies in which CNS functions are altered by antibodies to nerve cell constituents. They have shown that antibodies to ganglio-

sides can inhibit both the consolidation and retrieval phases of passive-avoidance learning without impairing acquisition and administration of antiganglioside antibodies to 5 day old rats, a critical period for dendritic development, produces in the adult animals a behavioral deficit associated with chemical and morphological changes in somatosensory cortex. No cells are lost but dendritic development is altered and substantial losses in both gangliosides and myelin are found. Drs. Mahadik and Rapport are continuing their studies of the antigenic polypeptides in synaptic membranes. The subcellular distribution shows that 5 of the synaptic membrane antigens are shared with smooth endoplasmic reticulum (SER) and synaptic vesicles, consistent with axonal transport of these membrane constituents from the cell body via the SER. Regional distribution studies show important quantitative differences between cortex, hypothalamus, hippocampus, and cerebellum, suggesting that synaptic connections must differ in antigenic composition and that it may be possible to characterize the different types of synapses by means of immunochemical analysis.

The laboratory of Dr. James L. Roberts was established in May in the Center for Reproductive Sciences following his arrival from the University of California in San Francisco. Dr. Roberts' research interests are in the area of molecular endocrinology, particularly the control of expression of various peptide hormones in different tissues. The major thrust is presently in the study of the pro-adrenocorticotropin/ β -lipotropin gene and its expression in neural tissue.

Dr. Sol Spiegelman and his colleagues have made significant progress in their effort to devise a diagnostic signal for human breast cancer. They had previously demonstrated that human breast cancer cells contain a protein unique to this malignancy and one that crossreacts with gp52, a 52,000 dalton glycoprotein found in mouse mammary tumor virus. They have developed a highly specific procedure for detecting both primary and metastatic lesions in tissue sections. This has been successfully employed by surgical pathologists to diagnose ambiguous cases and to detect microscopic tumors which might have been missed by the usual examination methods employed. Two clinical parameters have been identified as correlates of high levels of this antigenic signal. One is a positive family history of breast cancer, and the other is the aggressiveness of the disease. Specific reagents are being devised using the purified human breast cancer antigen and hybridomas. These will be employed to develop a systemic diagnostic signal for this antigen in the plasma of breast cancer patients, a possibility which has been

fully realized in the mouse mammary tumor model.

Dr. P. R. Srinivasan continued his investigations on the genetic and biochemical properties of conditional lethal mutants defective in DNA synthesis. Two of these mutants failed to complement each other and the *ts* lesion was not located on the 'X chromosome.' The mutants also showed interesting differences in their response to ethylmethanesulfonate at the ouabain resistant and thioguanine resistant loci. Other studies suggest that the biochemical lesion in these mutants cannot be attributed to a defective DNA ligase. In collaboration with Dr. B. Lewis, University of Toronto, he has been evaluating the various parameters that affect gene transfer in mammalian systems with chromosomes or DNA as the vector. Mtx^R (methotrexate) transformants arose at 10 to 20 fold higher frequencies when chromosomes were used as the vector instead of DNA. Of the transformants which arise from chromosome-mediated transfer, 20 percent were stable for Mtx^R resistance when cultivated in the absence of methotrexate. All the transformant clones from DNA transfer experiments were unstable in the absence of methotrexate.

Honors and Activities

Dr. Richard Axel was awarded the 1979 distinguished Young Scientist Award of The Passano Foundation for outstanding work in the field of cellular genetics.

Drs. Ruth and Reinhold Benesch spoke at the Gordon Conference on the Red Cell.

Dr. Isidore S. Edelman presented the Peter Curran Lecture at Yale University as well as the 11th annual Gregory Pincus Memorial Lecture at The Worcester Foundation for Experimental Biology. Dr. Edelman was appointed The Karl Beyer Visiting Professor at

the University of Wisconsin and presented a series of lectures on thyroidal regulation.

Dr. Dezider Grunberger presented lectures in various parts of Western Germany on different aspects of chemical carcinogenesis.

Dr. Arthur Karlin was appointed to the Editorial Boards of the *Journal of Biological Chemistry* and the *Journal of Molecular Pharmacology*.

Dr. Alvin I. Krasna was an invited speaker at the Hudson-Bergen Section of the American Chemical Society and the American College of Dentists.

Dr. Barbara W. Low was an invited lecturer at the EMBO Workshop on Polypeptide Neurotoxins in France and the Sixth International Symposium on Animal, Plant and Microbial Toxins in Sweden.

University Professor Sol Spiegelman was elected to the Board of Trustees, Sackler School of Medicine, New York, received a Ph.D. (*Honoris causa*) from the Weizmann Institute of Science, Rehovot, Israel and was an official visitor to China by special invitation of the Chinese Academy of Medicine and Medical Science.

Dr. P.R. Srinivasan was elected to the Presidency of the New York Academy of Sciences for the coming year.

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Dermatology

LEONARD C. HARBER

Professor and Chairman • Director of Service

A major accomplishment of the past year was the renovation of a unit in the Vanderbilt Clinic and its dedication to Dr. Anthony M. Domonkos. This new area was built to contain both audiovisual and patient care facilities. It will accommodate television and other audiovisual equipment and will function as a modern teaching center for both students and practitioners. Another exciting development was the expansion of the Ambulatory Psoriasis Center in the Atchley Pavilion, making it the largest and most modern such unit in the United States.

The Department also accepted as a new teaching responsibility the incorporation of dermatology into each student's clinical training program.

The death of Dr. Anthony M. Domonkos, Professor Emeritus of Clinical Dermatology, who was serving as president of the American Dermatologic Association, saddened his many colleagues and friends. His devotion to the highest principles of our specialty in general and our department in particular will be sorely missed.

Teaching

For the first time Dermatology is involved as an integral part of the clinical year teaching of medical students. Each student now has an intensive two week course designed to offer theoretical and practical aspects of dermatologic care under the supervision of the attending staff. The University continued to offer postgraduate training in Mycology in a course led by Dr. M. Silva-Hutner.

The Carl Truman Nelson Memorial lecture was inaugurated with an address by Dr. Robert Goltz, M.D., Professor & Head of the Dermatology Division, University of Minnesota, and President of the American Academy of Dermatology. He discussed "Transplantation: A Clinical Experimental Model for Dermatologic Diseases."

The Continuing Medical Education program again offered lectures by a prestigious group of visiting professors as well as a seminar taught by the Department of Human Genetics.

Postgraduate teaching for housestaff in primary care specialties was expanded to include one- and three-month fellowships for residents in the Department of Medicine.

Research

Research programs in progress in the several laboratories of the Department were augmented this year by the presence of three international guest investigators. Dr. Cristina Sconfienza, of Padua, Italy had joined the group in the laboratory of Dr. Maureen Poh. Dr. Sconfienza has initiated studies of properties of porphyrin associations with selected blood proteins. Dr. Poh's research focuses on exploring pathophysiologic mechanisms of disorders of porphyrin metabolism. During the last year data was obtained indicating heterogeneity for tissue sources of porphyrin excesses among patients with protoporphyria as well as seasonal variation in circulating porphyrin burden in the blood of these patients.

Joining the group working with Dr. Richard Edelson was Dr. Shinichiro Takesaki from Tokyo, Japan. He is using techniques of cellular immunology to study the production of antilymphocyte antibodies. Drs. Carole Berger and Edelson are developing a hybridoma system for production of monoclonal antibodies against cell surface antigens of normal and abnormal mononuclear cells for use as both diagnostic and research tools.

Under the supervision of Dr. Leonard Harber, Dr. Hideyuki Ichikawa of Tokyo, Japan is developing new methodology for studying cutaneous photoallergy in an animal model system.

Dr. Alan Andrews investigated the effects of ultraviolet radiation on the DNA of human cell lines with special emphasis on DNA repair processes.

Dr. Robert Armstrong participated in projects elucidating immunological mechanisms of photosensitivity disorders and of pemphigus vulgaris. He had also initiated a prospective computerized analysis of the efficacy of the Goeckerman treatment for psoriasis in a large population of patients.

Dr. Irene Kochevar detected ultraviolet radiation-induced changes in cutaneous DNA and further studied the mechanisms of ultraviolet damage to membrane proteins and phospholipids. She and Dr. Fung Lung Chung studied the effect of light on reactions between chlorpromazine, a photoactive medicinal compound, and DNA.

Dr. Margarita Silva-Hutner developed methods for testing the sensitivity of fungal isolates when exposed to antifungal agents *in vitro* and *in vivo*. She also prepared antigens and raised antisera against unusual opportunistic fungal isolates as a means of determining the possible pathogenic role of these fungi in the patients from whom they are recovered.

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Patient Care

During 1979 the clinic census increased to 2,120 visits to the Dermatology Clinic. An increase in the patients census to 51 admissions occurred. The consultation service evaluated 615 patients. The Dermatopathology laboratory processed 4312 biopsy specimens.

The Ambulatory Psoriasis Treatment Center is now participating in a clinical research protocol to evaluate selected aspects of out-patient Goeckerman treatment. A specially trained nursing and administrative staff which is an integral part of the phototherapy unit has received warm acceptance from the patients under treatment.

The dermatologic diagnoses of all patients are now being entered into a departmental computer to facilitate data retrieval for the purpose of improving patient care and research.

In the Vanderbilt Clinic, increased patient visits have necessitated plans to expand the number of clinic sessions. The waiting area in this facility has been modernized, providing a more comfortable setting for patients, and an appointment schedule has been instituted to decrease their waiting time.

Acknowledgments

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Human Genetics and Development

RICHARD A. RIFKIND

Professor and Acting Chairman

Research

During the past year the Department has continued to exercise its responsibility for research in the areas of human genetics and developmental biology. These activities encompass a broad spectrum of inquiry ranging from molecular genetics to the clinical application of the principals of genetics and development in the context of diagnosis, treatment and counselling for patients at the CPMC.

Dr. Kimball Atwood has studied factors that control rDNA multiplicity. With Dr. Donald Komma, he has discovered a genetic system in *Drosophila* that generates relative deficiencies of rDNA at a rate of about 1% per generation. The required genotype is a partial 5S DNA deficiency combined with a new dominant allele of claret, leading to a greatly increased frequency of unequal sister chromatid exchange within the rDNA segment. Together with Drs. Ann Henderson and Ming T. Yu the group has located EBV DNA in chromosome 7 of the transformed human cell line, RAJI, by means of hybridization *in situ*, and have found an associated structural modification of chromosome 7q.

Dr. Arthur Bloom has been engaged on a long term study of the highly inbred human populations on the Cayman Islands, British West Indies. They have identified a lethal form of mucopolysaccharidosis as a variant of the San Filippo A disease, and have initiated studies on the etiology of a new disease, Cayman Disease (cerebeller ataxia, mental retardation, abducens palsy). In addition Dr. Bloom is studying mechanisms of chemical mutagenesis using cultured hamster ovary cells assayed for sister chromatid exchange formation and chromosome breakage, both of which

are indirect measures of mutagenicity.

Dr. Arthur Bank has continued studies on the structure and organization of normal and abnormal human globin genes. With Drs. F. Ramirez and A.L. Burns he has isolated β and γ globin genes from β^+ thalassemia patients by recombinant DNA technology, and has shown that the two γ globin genes in man are linked on a single fragment of DNA separated by 3.5 kilobases. Other polymorphisms in human DNA have also been demonstrated using this technology.

Dr. Harold Calvin has continued studies on the function of trace elements in the development of sperm. He has established a correlation between zinc uptake and cysteine-rich sperm protein synthesis which occur late in spermiogenesis. The localization of the major sperm selenoprotein in the outer mitochondrial membrane has been established and appears to be a post-translational event at about stage 10 of mouse spermiogenesis. The outstanding defect in selenium-deficient mouse sperm is disorganization of the mitochondrial helix, while zinc-deficient rat sperm display incorrect organization of keratin-like tail components of less specific character.

Dr. Georgiana Jagiello, working in the overlapping disciplines of reproductive endocrinology and mammalian germ cell meiotic development, has concentrated on diplotene analysis of chiasmata, the mode of action of luteinizing hormones in oocytes, completion of pachytene maps of the female mouse and human male and female germ cells, and quantitation of gene amplification in the human oocyte.

Dr. Elvin A. Kabat, with Drs. Stephanie Phillips

and O.J. Miller, is devising new affinity techniques for sorting cells on the basis of cell surface antigen expression. Pure populations of viable cells with particular lectin receptors can be isolated with these techniques, and a study is in progress on variation in the expression of A, B, and H antigens on the surface of human epithelial cells in culture and on human-mouse somatic cell hybrids. With Dr. Shu Chien (Physiology) he is studying blood group lectins including *Dolichos biflorus*, *Helix pomatia*, *Ulex europeus*, and *Limulus polyphemus*. They are examining the number of lectin receptor sites on human red blood cells, changes in the morphology of red cells and lectin binding, and the correlation between shearing force and binding of lectins.

Dr. R.S. Krooth and Dr. J. Chen continued studies of human cell lines trisomic for chromosome #2 which synthesize increased amounts of the tissue restricted enzyme acetylcholinesterase. They have succeeded in characterizing a variant cell line with acquired phenylalanine hydroxylase activity. With Dr. Barry Potvin experiments were also undertaken to study the role of mutation in drug resistance and oncogenic virulence.

Dr. Orlando J. Miller in collaboration with Drs. Dorothy A. Miller and Ramana Tantravahi, is continuing his studies of ribosomal RNA gene amplification and its importance in the regulation of ribosomal RNA synthesis. Dr. Dorothy Miller in collaboration with Drs. Kent J. Weinhold and E.F. Wheelock (Department of Microbiology, Thomas Jefferson University) is investigating the nature of the tumor dormant state, having ruled out hybridization with host cells as a factor.

Dr. John D. Rainer in collaboration with Dr. L. Erlenmeyer-Kimling (Psychiatry) continues to study children with one or two schizophrenic parents in order to identify subgroups of high risk children. The parameters under study include attentional-cognitive dysfunction at an early age, early neuromotor disturbances, and unusual visual evoked response patterns. With Dr. M. Baron (Psychiatry) Dr. Rainer is collecting family and pedigree data on schizophrenia for incorporation into multi-threshold transmission models, in order to explore the range of schizophrenia sub-forms.

Dr. Richard A. Rifkind has explored the relationship between the cell division cycle and factors that regulate the program of cell differentiation in erythroleukemia cells. It was demonstrated that the initiation of globin mRNA synthesis which occurs in G1 phase of the cell cycle requires exposure to the differentiation-inducing agent during a preceeding early S-phase. Dr. Paul Marks has examined the control of globin mRNA synthesis in these same cells, demonstrating that the rates of accumulation of

α - and β -globin mRNA are determined, in part, by changes in mRNA stability during induced differentiation. Dr. Roberta Reuben has addressed herself to the problem of changes in nuclear proteins, including protein modifications, which may be of significance during terminal erythroid cell development.

Dr. Sol Spiegelman continued his studies on the development of a diagnostic antigenic signal for human breast cancer. He has developed a highly specific procedure for detecting both primary and metastatic lesions in tissue sections. Two clinical parameters have been identified as correlates of high levels of this antigenic signal. One is a positive family history of breast cancer and the other is aggressiveness of the disease.

Dr. Dorothy Warburton in collaboration with Dr. Zena Stein (Public Health) continues the study of spontaneous abortion, demonstrating an increased risk associated with maternal alcohol consumption. An increased abortion risk with increasing maternal age has been shown to hold for chromosomally normal as well as trisomic abortions, and the effect on trisomy has been shown to depend upon the size of the chromosome involved. In collaboration with Dr. Richard Edelson (Dermatology) cytogenetic studies of tumor cells, cutaneous T-cell lymphomas have established the clonal origin of these multifocal tumors.

Dr. Herbert Weissbach has continued studies on the development of a completely defined, cell-free system for the expression of many bacterial genes in the *E. coli* genome. Dr. Arthur Weissbach has investigated mechanisms of DNA synthesis in HeLa cells with particular attention to the mechanism of the initiation step, the role of DNA polymerases α and γ in the strand displacement synthesis of Adenovirus DNA, and in addition has been studying the transfer of yeast genes into mammalian cells using recombinant DNA and transfection techniques.

Patient Care

Dr. A.D. Bloom continues his responsibility for direction of the programs in Clinical Genetics. During the past year, 299 outpatients were seen in the Genetics Clinic at Babies Hospital, and approximately 192 in the satellite clinics at Harlem and St. Luke's Hospitals. In addition, there were 2 in-patient consultations at Babies Hospital per week. The genetics unit within the Department of Obstetrics and Gynecology has expanded its program for the antenatal diagnosis of inherited disease, and the clinical genetics unit in the Department of Psychiatry is continuing to see a growing population of people who are concerned about the genetics of psychiatric illness or of early-onset deafness. The Genetics Diagnostic Laboratory, under the direction of Dr. Dorothy War-

burton, in the past year performed chromosome studies on approximately 350 peripheral blood specimens, 75 bone marrows, and 450 amniotic fluid samples.

On October 21, 1979, the Department and the school were stricken by the death of our chairman, Dr. Robert S. Krooth. The following is abstracted from the remarks of Dr. Arthur Bloom at the Memorial Service for Dr. Krooth:

Dr. Krooth was a pioneer in cellular genetics, having been one of the first scientists to recognize the potential value of studies of mammalian cells in tissue culture. He helped us to understand the growth properties of such cells, at a time when these were little understood. He maintained an active, lifelong research interest in the regulation of gene expression in somatic cells. His contributions to the scientific literature in the field were many, and he educated a generation of investigators into the elegance of cell culture genetics.

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- He was, however, not only a laboratory scientist of the highest caliber, and a departmental leader of great skill. He was also, in the true sense, a scientific "philosophe." He revelled in all of human biology. Bob was particularly intrigued by human variation. He derived insight into the nature of that variation from comparisons between mutant and normal cells. He wrote: From such studies we have learned not only about genetics, but also about the nature of life itself.
- Despite the work imposed by his responsibilities and despite the demands of his position as scientist-department chairman, he was always concerned about his people on the faculty and among the student body, in his laboratory and in his office. These concerns were a measure of his humanity and we shall remember that part of him well. Those of us who were his colleagues on the faculty will sorely miss him; those of us who were his friends will cherish our good memories of him.
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Medicine

THOMAS Q. MORRIS

Associate Professor of Clinical Medicine and Acting Chairman • Acting Director of Service

The Department of Medicine and the Medical Service sought and attained new levels of excellence during 1979. Success in patient care, medical education, and research depended upon the dedicated efforts of a talented and resourceful faculty in addition to the many, many generous donors who contributed to the support of existing and new programs.

On November 20, 1979, the Department officially opened new research laboratories occupying the entire ninth floor of the College of Physicians and Surgeons, and representing the principal research facilities of the Divisions of Cardiology and Pulmonary Diseases and the Atherosclerosis program of the Division of Metabolism and Nutrition. The laboratories were made possible by a \$750,000 grant from the Dana Foundation and matching funds raised by friends of the Department. Development of this modern research floor represented a significant step in the facilitation of new and existing investigative programs. The Department is deeply grateful to all those who supported this effort but in particular to the Dana Foundation.

On the same floor a conference room was dedicated in memory of our late Chairman, Dr. Daniel V. Kimberg. Construction and furnishing of this needed teaching facility was made possible by contributions from many of his friends and colleagues, both within the Department and throughout the United States. At a brief dedication and reception the Department presented Mrs. Kimberg and other members of his family bound copies of his scientific reprints, and inaugurated a lecture series supported by former residents and fellows of Dr. Kimberg. Dr. Michael Field,

Professor of Medicine and Physiology at the University of Chicago Medical School and a former colleague of Dr. Kimberg, delivered the first annual Daniel V. Kimberg Lecture. Each year these presentations will be devoted to research and patient care topics consistent with his interests.

The past year also brought significant changes among the hospitals affiliated with Columbia University. St. Luke's and Roosevelt Hospitals merged to become the St. Luke's-Roosevelt Hospital Center. Dr. Stanley Cortell was named Acting Director of the Medical Service at St. Luke's Hospital. In addition Morristown Memorial Hospital located in Morristown, New Jersey, joined the group of affiliated hospitals. The Department of Medicine looks to these changes to provide additional resources and new strength in its programs.

Among a number of distinguished visitors during the past year was Dr. Daniel Federman, Professor of Medicine and Associate Dean for Student and Alumni Affairs at the Harvard Medical School; Dr. George M. Cahill, Jr. of Harvard Medical School, who delivered the David Seegal/Alpha Omega Alpha Lecture; Dr. Michael Potter of the National Cancer Institute, who delivered the eighteenth Michael Heidelberger Lecture; and Dr. Sidney H. Ingbar, also of Harvard Medical School, who delivered the Sidney C. Werner Lecture.

Dr. Henry Aranow, Jr., Samuel Lamberg Professor Emeritus of Medicine, continued to serve the Department with distinction. Dr. Aranow was Chairman of the Editorial Board for *Medical Journal*, a daily radio program prepared under the aus-

pices of the Columbia-Presbyterian Medical Center in conjunction with the Scott Broadcasting System and the Prudential Insurance Company. This program, which was aired over more than 200 radio stations daily, provided a unique source for current medical news.

Dr. Stanley E. Bradley, Samuel Bard Professor Emeritus of Medicine, continued to serve as Professor of Clinical Pharmacology at the University of Berne, Switzerland, where he directed physiologic studies on hepatic and renal function.

Dr. Albert R. Lamb, Jr. retired from academic activities after life-long service to the Department of Medicine. His dedicated service as Director of the Student Health Service, as supervisor of the group clinics, and as a vigorous participant in the teaching programs of the Department will long be remembered.

At the 1979 commencement exercises Dr. Aranow received the Dean's medal for distinguished service to the College of Physicians and Surgeons and Dr. Morris was the recipient of the Dean's award for outstanding contributions to teaching at P&S.

Teaching

Undergraduate medical programs continued to be the focus of major faculty effort. The Introduction To The Patient course was taught for the first time as a block experience during the month of May. Other major departmental effort was concentrated in the third year medical clerkship and multiple clinical electives, both of which were taught at almost all of the affiliated hospitals. An ambulatory care program, which will be required for all fourth year medical students in the coming year, is being planned under the direction of Dr. Michael M. Stewart. This experience, which will be combined with a Public Health clerkship, will also be taught in every affiliated hospital. Re-emphasis of ambulatory care is consistent not only with national goals, but also with the longstanding interest and tradition of the Department.

A new coordinating structure, Introduction to the Practice of Medicine, was developed by the Curriculum Committee to deal with many of the first and second year courses concerned with practice and/or clinical medicine. Prominent among these was the first year patient-physician relationship course which was again co-directed by Dr. Wylie C. Hembree, III and Dr. Stephen Rosenberg (Public Health). Faculty from throughout the University was involved in this effort. Among new programs were courses in medical economics and issues and human values in health care. Dr. Aranow served as the Director of the Ethics and Values Program in the College of Physicians and Surgeons. This overall effort was directed by Dr.

Robert E. Canfield in association with Dr. Eric Marcus and Dr. Morris.

In the second year medical school curriculum Dr. Canfield also directed Abnormal Human Biology, the major course in Pathophysiology. The goal of this course is to provide an introduction to clinical diseases through discussions of case material. The teaching, which was system oriented, was directed by the following faculty members: Dr. Ronald Drusin, Cardiology; Dr. Rejane M. Harvey, Pulmonary Diseases; Dr. Donald A. Holub, Endocrinology and Metabolism; Dr. Rose Ruth Ellison, Oncology; Dr. Robert M. Glickman, Gastroenterology; Dr. Qais Al-Awqati, Nephrology; Dr. Vincent P. Butler, Jr., Immunology and Rheumatology; and Dr. Harold C. Neu, Infectious Diseases.

Dr. Morris directed and coordinated The Introduction to the Patient course. In addition to being taught in a block experience for the first time, the course also heavily involved members of the psychiatric liaison faculty. Efforts of these instructors were directed by Drs. Jerrold Maxmen and David Kornfeld (Psychiatry). The combined efforts of the Departments of Medicine and Psychiatry was undertaken in order to emphasize the critical importance of psychosocial factors in the approach to the patient. The joint use of psychiatrists and internists was followed at all the affiliated hospitals where efforts were directed by the following members of the faculty: Dr. George C. Branche, Jr., Harlem Hospital; Dr. Arthur R. Wertheim, Presbyterian Hospital; Dr. Henry M. Greenberg, Roosevelt Hospital; and Dr. William A. Tansey, St. Luke's Hospital.

Dr. John N. Loeb directed the major clinical year of medical clerkship, a three month experience equally divided between Presbyterian Hospital and one of the other affiliated hospitals in Manhattan. This course, which is designed to develop the skills necessary for integration of basic science information and clinical findings into a meaningful clinical impression and plan for diagnosis and treatment, was directed by the following faculty: Dr. Gerald E. Thomson, Harlem Hospital; Dr. Marianne J. Legato, Roosevelt Hospital; and Dr. John F. Bertles, St. Luke's Hospital.

Fourth year elective programs were offered enthusiastically by the staff of every affiliated hospital. Experiences in medical subspecialties and subinternships were heavily subscribed. The faculty of the Department of Medicine continued to offer more than half of all elective opportunities sought by fourth year students.

Growth of Continuing Medical Education (CME) continued to be remarkable. Both departmental and divisional conferences were certified for AMA Cate-

gory I credit. Prominent among these were the Combined Staff Clinics, directed by Dr. Elliott Osserman. Attendance at these exercises and Medical Team Rounds was encouraged not only for staff members but also for physicians in the local community in order to provide wide-spread availability of CME credits.

Presbyterian Hospital: Clinical Activities

Admissions totalled 7,169; deaths, 559; autopsies, 112.

Bed occupancy on the Medical Service throughout the year was always above 90%. The service accounted for more than 90,000 patient care days, nearly 25% of the Presbyterian Hospital total. Patients on the Medical Service were acutely ill and usually suffered from multiple problems. Cardiovascular disorders continued to be the most frequent presenting problems.

Faculty continued to play a major role in successful delivery of care and instruction of residents in the Walk-In Clinic in Area B, in the Group Clinics, and in the newly organized Rapid Evaluation Department (RED) on the first floor of Vanderbilt Clinic. The latter unit was opened in order to facilitate patient flow in the emergency areas of the Presbyterian Hospital and to allow patients to be seen promptly by a physician. This unit was directed by Dr. Kenneth Fine, who as Director of Emergency Services in the Presbyterian Hospital was also responsible for activities in the Emergency Room and the Walk-In areas.

Staff members also played a major educational role in the Group Clinics. As Physicians in Charge (PIC) they supervised patient care and observed residents in the conduct of routine histories and physical examinations. Faculty serving in this role were Drs. Michael Cohen, Qais Al-Awqati, Oliver Fein, Donald A. Holub, Israeli Jaffe, James Reiffel, John Postley, Jane S. Sillman, Jeffrey Stein, Joseph Sweeting, Arthur R. Wertheim, Robert T. Whitlock, and Gail Williams.

The past year was marked by remarkable growth in both the staff and the patient population of the group practice in the Vanderbilt Clinic. The faculty in this undertaking, known as Associates in Internal Medicine (AIM), provided continuity of care for ambulatory patients during their hospitalizations. The number of patients in this practice grew to more than half of all the medical patients seen in the primary care medical clinics of the Presbyterian Hospital. The faculty in the practice also assumed major roles in medical student education, residency training, and service attending responsibilities in the Presbyterian Hospital.

Patient care activity in both the Emergency Room and the Walk-In area of Vanderbilt Clinic continued to increase. In Area A more than 36,383 patient visits were recorded. In Area B another 32,724 patients were cared for by a team of attendings, residents, nurse practitioners, and nurses. Dr. Oliver Fein supervised patient care activity in the group clinics where 31,525 patients were seen. Activity in the medical specialty clinics was also high. The 55,960 patient visits were coordinated by Dr. Michael M. Stewart, Director of the Medical Clinics of the Presbyterian Hospital.

During 1979 the medical housestaff was organized as follows: R-I 25; R-II 24; R-III 18; and R-IV 1, the Chief Resident was, Dr. Jose Marcal who expertly coordinated the activities of the excellent resident staff.

The high rate of occupancy produced great strains on the medical and cardiac intensive care units, but these ran at maximum efficiency through the tireless efforts of Dr. Glenda J. Garvey and Dr. James Reiffel, who respectively directed the activities in these units. The Medical Service looks forward with great anticipation to expansion of these units in the Priority Projects Program which has been undertaken by the Presbyterian Hospital.

Although teaching continues to occupy a high position in every area of the Medical Service, particular emphasis was put on this function in the Harkness Scatter Service, where Dr. Ralph S. Blume directed a series of daily conferences and rounds that established new and high educational standards in this unit. The Medical Service anticipates that geographic localization of these beds in the Priority Projects Program will facilitate not only patient care but also physician education. Dr. Whitlock continued to direct the Harkness 7 and 9 Service with great skill and dedication.

Many members of the faculty participated in assessment of the clinical skills of the resident staff. These assessments, required by the American Board of Internal Medicine, were largely performed in the Harkness teaching setting by the monthly attendings assigned to those units. The Clinical Competence Committee, chaired by Dr. Morris, directed the efforts of faculty in this program. The Utilization Review Committee of the Medical Service provided the staff and the hospital with the optimal model of activity. This group was chaired by Dr. Jeffrey Stein who was ably assisted by Drs. Oscar Lebowitz, Robert McConnell, and Allan Schwartz. The Medical Service Patient Care Committee was again chaired by Dr. Kermit Pines in coordination with Ms. Sandra Byrd, Associate Director of Nursing for Medicine. Drs. Garvey, Marcal, and Morris also served on this

Committee along with the Head Nurse from each medical unit. Dr. Jack Weissman served as Chairman of the Medical Adult Committee. He was ably assisted by Drs. Richard Stock and Joseph Sweeting. Medical Service Peer Review Committee was directed by Dr. Michael J. Cohen in association with Dr. Gail S. Williams and Dr. Morris. Dr. Hamilton Southworth organized a Critical Care Committee to assist Medical Service physicians in the care of terminally ill patients. The committee, which has a variety of support services available, consists of Drs. Southworth, Garvey, Kornfeld, and Marcal plus members of the Nursing Service.

Division of Cardiology

Teaching

P&S students were offered electives in clinical cardiology, hypertension and cardiovascular research; 38 students enrolled in these elective programs. A weekly ECG-Clinical Electrophysiology Conference was begun for undergraduate and postgraduate students. This conference is supervised by Drs. Francis M. Weld, James A. Reiffel, and M. Irene Ferrer. The division conducted two postgraduate courses this year, one in Hypertension and Renal Pathology and the other on Ischemic Heart Disease. The latter course was held in conjunction with Alumni Day. An update lecture series was initiated to keep house staff and attendings abreast of new developments in cardiology.

Clinical Activities

The *Hypertension Unit* conducted active consultative activities via the Nephritis Hypertension Clinic and the Hypertension Center. With support from the New York State Department of Health, the Hypertension Unit has established a model Worksite Hypertension Control Program at four locations. This program will determine the economic and health care benefits of worksite education, detection and treatment for hypertension.

The *Nuclear Cardiology Unit* expanded to provide a full range of clinical radionuclide studies of myocardial perfusion and ventricular performance studies. Many clinicians find these tests useful in the management of atypical chest pain, coronary artery disease, valvular disease and primary myocardial diseases.

The *Arrhythmia Control Unit* established a referral diagnostic and treatment program in 1979. This new service was well utilized. The Clinical Electrophysiology Laboratory was opened in September to provide diagnostic services to patients with cardiac arrhythmias and conduction defects. This new labo-

ratory provides electrophysiology tests on a service basis and works in parallel with the research clinical electrophysiology laboratory. The new IBM ECG computer cart now provides instantaneous analysis of the ECG at the bedside and provides an immediate printed interpretation.

The Cardiology Computer Laboratories improved its data base facilities and expanded its ECG processing resources. The heart attack followup data base has over 400 cases online for clinical and research use.

Dr. Melvin B. Weiss continued to use the myocardial biopsy as a diagnostic tool in conjunction with heart transplantation and cardiomyopathies.

Research Activities

Hypertension Unit

Dr. Baer studied the blood pressure and endocrine responses to cigarette smoking in man. In collaboration with Dr. Gail S. Williams, he also investigated the treatment of severe hypertension using angiotensin converting enzyme inhibitors or potent vasodilators. Dr. Margaret Kilcoyne continued her studies of adolescent hypertension and of the renin-angiotensin systems in the brain.

Nuclear Cardiology Unit

Drs. Nichols, Cannon and Melvin B. Weiss studied the effects of human left ventricular hypertrophy on myocardial blood flow and left ventricular performance. Drs. Blood, Sciacca and Cannon continued their studies of 201 thallium stress tests. Drs. Stephen Goldman, Lynne L. Johnson and Weiss used radionuclide angiography to study the effect of chronic vasodilator therapy on left ventricular performance in patients with severe heart failure. Dr. Lynne Johnson completed a study of right ventricular function and blood flow in man using 99 Technetium.

Drs. Stephen Gunther and Cannon studied the effects of angiotensin II on blood flow and prostaglandin synthesis in the coronary vascular bed in the dog. Dr. Nichols with Drs. Karen Kaplan, John Owen and Hymie Nossel studied the relationships between platelet activation and the presence and extent of angiographically proven coronary artery disease.

Dr. Eric Powers initiated studies of myocardial perfusion and performance in canine models of myocardial ischemia.

Arrhythmia Control Unit

Dr. Francis M. Weld continued his study of function abnormalities and risk in the years following a

heart attack. With Drs. Bigger, Johnson and Reiffel he investigated the relationships among arrhythmias, left ventricular function, ischemia and electrical instability on the outcome of patients with a recent heart attack. They continued collaboration in a similar national study which also involved the University of Arizona, University of Rochester and Washington University. Over 400 patients were enrolled in the post heart attack follow-up program this year. Dr. Weld's pioneering studies on exercise testing two weeks after heart attack have firmly established his exercise protocol as a safe and useful procedure in the management of acute myocardial infarction. With Drs. Kaplan, Owen and Nossel, Dr. Weld studied the relationship between platelet function and clotting and outcome after heart attack.

Dr. James A. Reiffel and his colleagues in the Clinical Electrophysiology Laboratory, Drs. Bigger, Gang, Patton and Weiss, pursued studies of the human sinus node. This year, this group developed a catheter method for making direct recordings of the sinus node in intact, awake man. This is a breakthrough which will permit many new studies and insights into the behavior of the human sinus node. With Drs. Bigger, Patton and Gang, Dr. Reiffel began a comprehensive study of provocative electrophysiologic testing in patients with resistant ventricular arrhythmias. The emphasis in these studies is on patients with coronary artery disease, particularly those with a recent heart attack.

Dr. Elsa-Grace Giardina and her colleagues in the Cardiovascular Clinical Pharmacology Laboratory, Drs. Bigger, Edward B. Leahey, Jr., James M. Perel (Psychiatry) and Vincent P. Butler, Jr. continued their studies on cardiac drugs. In the General Clinical Research Center, she and her colleagues conducted efficacy and kinetic studies of sustained release procainamide, mexiletine and imipramine. Dr. Leahey has just begun studies on the antiarrhythmic efficacy of N-acetylprocainamide. In the Affective Diseases Research Unit, with Drs. Alexander H. Glassman, Bigger and Lynne Johnson, Dr. Giardina evaluated the effects of several tricyclic antidepressants on cardiac rhythm, conduction and mechanical performance in depressed patients. Dr. Johnson collaborated on studies of left ventricular performance and blood pressure.

Dr. Leahey with Drs. Reiffel, Bigger and Butler continued studies of the newly discovered interaction between quinidine and digoxin. This year a prospective study of prevalence and time course was conducted in the GCRC. A study of the kinetics of the interaction was begun in normal volunteers. Drs. Leahey, Giardina, Reiffel and Bigger showed that, unlike quinidine, several other oral antiarrhythmic

drugs failed to cause an increase in serum digoxin. In animal models, Dr. Leahey is studying the kinetics, renal handling, tissue distribution, receptor occupancy and intensity of effect of digoxin under the influence of quinidine.

To gain better understanding of arrhythmias occurring during myocardial ischemia, Dr. Weld studied the effects of lysophosphoglycerides on cardiac membrane systems in collaboration with Drs. Peter Corr and Burton Sabel (Washington University). Dr. Weld investigated the cellular electrophysiological effects of several cardioactive drugs in his laboratory: quinidine, imipramine, 2-OH-imipramine, desmethylinipramine. Drs. Jesse C. Davis and Bigger studied the effects of cardioactive and psychoactive drugs in several canine models of ischemic arrhythmias.

Honors

Dr. Leslie Baer was Visiting Professor at the College of Medicine and Dentistry of New Jersey, the Rutgers Medical College.

Dr. J. Thomas Bigger, Jr. served on the Editorial Board of *Stroke*, *The Journal of Pharmacology and Experimental Therapeutics*, *Pharmacology*, *Cardiovascular Pharmacology*, and the *American Journal of Medicine*. He served on a American Heart Association study section for Grant-in-Aid and as a Director of the New York Heart Association.

Dr. Paul J. Cannon was Visiting Professor in Medicine, University Hospital, Case Western Reserve and was an invited participant in the International Workshop on Myocardial Blood Flow in Celle, Germany. He served on the Editorial Boards of *Nephron* and *Circulation*.

Dr. M. Irene Ferrer served as Editor-in-Chief of the *Journal of the American Medical Womens Association*.

Dr. Margaret Kilcoyne gave a lecture on adolescent hypertension at an international symposium on hypertension in Parma, Italy.

Dr. Edward B. Leahey, Jr. received the John C. Sable Memorial Heart Award.

Dr. Francis M. Weld was elected to Fellowship in the Council on Clinical Cardiology, American College of Cardiology, American College of Physicians and the American Physiological Society.

Division of Endocrinology

Teaching

The Division participated extensively in the teaching of 2nd, 3rd, and 4th year medical students through a variety of courses, both required and elective. Postgraduate clinical training was also given to

house staff and fellows. An NIH-funded training program was available for research training of fellows who wish to pursue academic careers.

Research Activities

Dr. Frantz continued his studies of pituitary hormones and their control mechanisms. With Dr. Sharon Wardlaw he developed assays for the pituitary and brain peptides β -endorphin and β -lipotropin. These were measured in normal individuals and shown to correlate in the human fetus at delivery with arterial pH and pCO_2 (with Dr. Raymond Stark, Pediatrics). With Dr. Nora Farkouh (Pediatrics), Dr. Frantz defined multiple circulating forms of the hormone prolactin, and showed that the proportion of these forms in blood changes with acute stimulation of prolactin secretion. Also with Dr. Farkouh, as well as with Drs. Kaganowicz and Blaustein (New York University) Dr. Frantz identified ectopic human growth hormone in normal and diseased human ovaries and in the tumor of one patient with breast cancer. With Drs. Kazim Husain (Pediatrics) and William Manger, Dr. Frantz measured vasopressin in rats and showed that it did not rise with stress as several earlier studies had suggested, but that it did do so after body compression, associated with a rise in intrathoracic and intraabdominal pressure. The clinical utility of serum prolactin measurement as a diagnostic indicator of pituitary tumors was confirmed in several studies, and Dr. Frantz demonstrated that other diseases of the central nervous system not involving the pituitary or hypothalamic areas were not associated with elevations of serum prolactin.

Dr. John N. Loeb continued his studies on glucocorticoid binding by various fractions from rat liver. Studies with Dr. Gholamhosein R. Omrani revealed that a number of particulate fractions from normal liver possess saturable glucocorticoid binding sites which have a high capacity relative to those present in liver cytosol but an affinity approximately one order of magnitude lower. In contrast to previously described effects of hormone deprivation and repletion on binding by cytosolic glucocorticoid receptors, the binding exhibited by these particulate fractions disappeared upon adrenalectomy and was markedly enhanced by the administration of exogenous glucocorticoid hormone. Studies are in progress to further define the nature of this binding and its possible physiological significance. In other studies, Dr. Haruysau Furukawa and Dr. Loeb, in collaboration with Dr. John P. Bilezikian, continued their work on the influence of thyroid hormone on the beta-adrenergic responsiveness of the turkey erythrocyte. In keeping with their earlier observation of a

marked fall in the number of beta receptors in erythrocytes from hypothyroid birds, they found a striking reduction in the physiologic responsiveness of these cells to beta-adrenergic agonists as exemplified by catecholamine-mediated stimulation of monovalent cation transport. Additional studies have examined the thermodynamics and kinetics of tritiated ouabain binding by normal turkey erythrocytes, and the quantitative correlation between ouabain binding and the inhibition of active ion transport.

Dr. Kenneth Sterling's research program dealing with mechanisms of action of thyroid hormone continued with the collaboration of Dr. Bhanumas Dharmgrongartama, who left the laboratory in May, and the arrival of Dr. George Taliadouros from the Endocrinology and Reproduction Research Branch of the National Institute of Health. A high affinity, low capacity (specific) binder of triiodothyronine (T_3) had previously been obtained from mitochondrial membranes of rat as well as human liver and kidney. Fractionation of mitochondrial membrane protein entailed an initial step of Sephadex G-200 gel filtration. The large molecular weight fraction (150,000) bound T_3 with an association constant (K_A) of $10^{11} M^{-1}$ by Scatchard plot on addition of graded increments of T_3 in the picogram range. The displacement of tracer (^{125}I)- T_3 from cell nuclei after injection in vivo of nonradioactive T_3 was observed repeatedly. In contrast, displacement of tracer T_3 from intact mitochondria had not previously been reported, leading to the supposition that saturable receptors exist only in the cell nucleus. The present work showed for the first time that *in vivo* displacement of tracer (^{125}I)- T_3 was regularly observed when loading doses of nonradioactive T_3 were injected into the tail vein of the rat, provided the mitochondrial receptor was partially purified by gel filtration. Failure of displacement from intact mitochondria was attributed to abundant nonspecific sites on the outer mitochondrial membrane. Current evidence suggests that the mitochondrial receptor for T_3 arises from the inner membrane, the site of oxidative phosphorylation, which is viewed as a probable locus of direct hormone action.

Dr. Wylie Hembree and co-workers have continued studies in several areas related to male reproduction. These include: marihuana effects upon spermatogenesis and sperm function; endocrine and germ cell changes associated with the development of and recovery from Vitamin A deficiency in male rats; the association of structural and/or numerical chromosomal abnormalities in human clinical infertility; a therapeutic evaluation of testosterone rebound in the treatment of male infertility; the biochemical abnormalities associated with male re-

productive dysfunction; and the metabolism of ^3H -gonadatropin releasing hormone.

Honors

Dr. Frantz continued to serve as Associate Editor of *Metabolism*. Dr. John Loeb served as Visiting Professor at the University of Wisconsin and Beth Israel Hospital, Harvard Medical School. Dr. Kenneth Sterling gave an invited address at the 1979 Laurentian Hormone Conference. Dr. Sterling also served as Chairman of the Committee to visit the Medical Department of Brookhaven National Laboratory.

Division of Gastroenterology

Teaching

The expanded fellowship program offering clinical and research training in gastroenterology had four fellows actively enrolled in the program. A vigorous program of clinical and research conferences continued. A weekly liver biopsy review conference was conducted by Dr. Jay Lefkowitz (Pathology) who had recently returned from a year of study with Dr. Peter Scheuer at the Royal Free Hospital, London, England. A city-wide gastroenterology conference was held monthly on a rotating basis among the major medical centers in New York City.

Clinical Activities

During the past year, the new Gastrointestinal Endoscopy Unit grew and provided an expanded capability to conduct a variety of diagnostic gastrointestinal procedures.

Research Activities

Drs. Glickman, Green and Riley investigated the role of the intestine in lipoprotein synthesis. Studies in the rat and in man indicated that the intestine was an active site of synthesis of major apoprotein components of intestinal lipoproteins—apoB, A-I, A-II and A-IV which were synthesized during chylomicron formation. Recent studies in chyluric man gave an estimate of this synthesis. Measurements of apoprotein secretion in chyluric man indicated that the human intestine synthesized approximately 50% of the body's requirement for apoA-I and A-II. In addition, these studies identified a new human apoprotein, apoA-IV which also was actively synthesized by the intestine.

The mechanisms by which these apoproteins, which are secreted by the intestine in the form of chylomicrons, contributed to plasma levels of high

density lipoproteins were studied by Dr. Tall. Studies in the rat showed that during lipolysis of intestinal chylomicrons, there was transfer of components from the chylomicrons surface (notably phospholipids and apolipoprotein A-I) into plasma HDL. It appeared that phospholipids of chylomicrons were released as vesicles during hydrolysis of the chylomicron's triglyceride core. The released phospholipids (and apoA-I) were rapidly incorporated into pre-existing HDL particles. A variety of considerations indicated that chylomicron phospholipids and apoA-I were also transferred into human HDL during lipolysis, providing an important source of the chemical components of the anti-atherogenic high density lipoproteins. Furthermore, studies of human HDL, employing model systems, showed that a particular density sub-class of HDL was especially enriched in phospholipids and might represent the recipient particle for phospholipids and apoA-I transferred into HDL during lipolysis. It is possible that cholesterol is transferred into this particular HDL subfraction, providing a "cholesterol scavenging" effect in HDL.

Additional studies by Drs. Green, Glickman, and Tall indicated that the intestine may also secrete a nascent form of high density lipoprotein directly into mesenteric lymph. These HDL particles may further contribute to plasma HDL levels.

Recently developed radioimmunoassay techniques were employed to measure important apoproteins such as apoA-I directly in intestinal mucosal cells. Studies in the rat indicated that small intestinal apoA-I synthesis might be triggered by triglyceride feeding. In addition increased intestinal cholesterol synthesis (i.e. after biliary diversion) also appeared to stimulate apoA-I synthesis supporting the concept that apoA-I might be secreted from the intestinal mucosa in the absence of triglyceride absorption.

Dr. Thomas Brasitus in collaboration with Dr. David Schachter (Professor of Physiology) continued to investigate the influence of the physical state of membrane lipid and protein function in the small intestinal cell's plasma membrane. This membrane has two distinct regions; a luminal and contraluminal portion. Each region's lipid was shown to undergo a change in the physical state of the lipid in the vicinity of normal body temperature using the technique of steady state fluorescence polarization and differential scanning calorimetry. These transitions appear to modulate several important physiological activities of the membrane. In addition each region had a different "fluidity" which could be accounted for by a difference in their protein and lipid composition. These studies provide evidence that differences in the chemical composition of distinct

regions of the intestinal cell membrane can be correlated with important differences in biologic function.

Dr. Hugh Nellans continued studies on the mechanisms of calcium absorption by the small intestine. Investigations continued to elucidate the cellular and paracellular pathways of calcium transport in both small and large intestine of the rat as modulated by vitamin D.

In comparing regional efficiency of calcium absorption, the cecum was to transport calcium at rates in excess of duodenum in rats of the same age. With corrections for intestinal transit time these data suggest that the cecum may be the predominant site of calcium absorption in the rat. In addition, isolated rat epithelial cell plasma membranes were employed to study the intestinal transport mechanisms of calcium and sodium at both the luminal and basal epithelial cell poles. Evidence suggested that Vitamin D-dependent membrane proteins at the brush border might be responsible for both intracellular sequestration as well as transmembrane transport of calcium. Movement of sodium across the isolated brush border membrane was shown to require medium sodium consistent with a predominant NaCl coupled uptake mechanism while the participation of a Na:H exchange mechanism at this site contributed minimally to sodium transport. It was also demonstrated in rat small intestine that the cathartic, phenolphthalein, functioned predominantly by inhibiting a cellular pathway for sodium absorption, presumably the Na-K ATPase.

Drs. Joseph Sweeting, Jeffrey Stein, Robert Whitlock, William Lee, and Oscar Lebwohl actively investigated the clinical efficacy of Coherin in the treatment of inflammatory bowel disease. A double blind study is near completion.

Professor Stanley E. Bradley continued his studies and teaching as Gast-professor fur Hepatologie in the Department of Clinical Pharmacology of the University of Berne, Switzerland. During the past year he has completed studies of changes in canalicular permselectivity in the hypothyroid rat that are consistent with a selective impairment of anionic transport involved in formation of bile acid independent bile flow. With Dr. Geraldine P. Bradley, he found that ether and pentobarbital did not affect bile formation or permselectivity in normal rats. He is now measuring molecular charge and steric sieving by the canalicular membrane and interstitial matrix using neutral and anionic dextrans of graded size and anionic and polycationic plasma albumin for this purpose. This work is designed to extend and enlarge investigations of biliary macromolecular losses carried out with Dr. Thomas Q. Morris and Mrs. Katharine Baker during recent years.

Honors

Dr. Glickman was elected to the Editorial Board of the *Journal of Clinical Investigation*. He also served on the Training and Education Committee of the American Gastroenterological Association and on the National Scientific Advisory Board of the National Foundation for Ileitis and Colitis.

Drs. Green, Brasitus and Lee were elected to membership in the American Gastroenterological Association and the New York Gastroenterological Association.

Dr. Tall was awarded an Established Investigatorship by the American Heart Association and a Fellowship from the Irma T. Hirsch Foundation.

Division of General Medicine

Teaching

The Division assumed increasing responsibility for coordination and supervision of the education and training of residents in ambulatory care settings at P.H., including the Medical Primary Care Clinics and the Adult Walk-In Service. The one-month Internal Medicine Ambulatory Care Elective for Year 4 students was heavily subscribed. DGM faculty provided major clinical input into the School of Nursing's Master's Degree Nurse Practitioner Program, and participated actively in the Epidemiology and Public Health courses for medical students.

Clinical Activities

In August, Associates in Internal Medicine (AIM), a new faculty group practice arrangement, was formally established. AIM, the clinical practice arm of the DGM, provides personal care to its enrolled users. By the end of 1979, one-half of all general medical clinic visits had been incorporated into the AIM group practice, with DGM faculty members providing ongoing ambulatory care as well as inpatient-outpatient continuity. The second floor of the Vanderbilt Clinic building is being renovated for occupancy by AIM by mid-1980.

Research Activities

Drs. Michael Stewart and Kenneth Fine continued their active participation in the Macy Foundation supported Columbia-Affiliated Hospitals Emergency Care Project, including studies of emergency care utilization patterns and resource allocation in the four Columbia-affiliated hospitals in Manhattan. Dr. Constance Park continued her investigation of the measurement of glycosolated hemoglobin levels in the long-term management of patients with diabetes mellitus.

The DGM coordinated research projects conducted by two doctoral students in the Division of Sociomedical Services of the School of Public Health. One project analysed the relation between patients' ambulatory care expectations and levels of satisfaction. The second addressed factors affecting the humanistic dimension of the ambulatory care doctor-patient relationship.

Two P&S '82 medical students received grant support for summer research projects conducted under DGM supervision. One project focussed on preventive intervention as a component of ongoing primary care; the second assessed the general needs of geriatric patients in the senior citizen centers in neighboring community.

The Third-Year Clinical Clerkship remains the core of Third-Year medical teaching at P & S. The Medical Clerkship provides an opportunity for a student not only to add to his factual knowledge but, far more importantly, to learn to apply pathophysiological principles acquired in earlier courses to the management of individual sick human beings. Such skills, which can be thought of as primarily *integrative* in nature, are not learned easily, but require time, hard work, constant application, and repetition. To this end students are assigned for two consecutive six-week periods at Presbyterian Hospital and Harlem, Roosevelt, or St. Luke's Hospital, where they are assigned in groups of three or four to the patient-care teams. During this time each student has an opportunity to function as an essential part of the regular ward team, and his first responsibility is to know his patients in as intimate detail as possible, including the relevant personal and social factors in their environment which relate to their illness and to their reaction to their illness.

In addition to participating in daily bedside attending rounds and other formal patient-care responsibilities during the Clerkship, students are assigned in groups of six to a medical preceptor who meets with them three to four times a week to review their progress on the wards, to discuss pathophysiologic mechanisms with specific reference to their patients, and to guide them in the elicitation and recording of a precise, literate, and informative medical history. The latter is a particularly demanding responsibility, and the Department at P & S is particularly fortunate in having a number of gifted teachers who give most generously of their time and do so with flair and enthusiasm.

Honors

Dr. Michael Stewart was appointed to the Health Services Research and Development Grants Committee of the National Center for Health Services

Research. As a consultant to the Rockefeller Foundation, he conducted a site visit and program assessment of Foundation-supported Health Sciences/Community Medicine activities at Gadjah Mada University, Yogyakarta, Indonesia. Dr. Stewart was also appointed to the Advisory Council of the Princeton University Health Services. He delivered an invited address at the Macy Foundation Conference on Emergency Medical Services and served as a member of the New York State and Middle Atlantic District Rhodes Scholarship Selection Committees.

Dr. Oliver Fein and Ms. Evelyn Lieb were invited participants at a Greater New York Hospital Association panel discussing "New Modes of Ambulatory Care Delivery."

Hematology Division

Research Activities

Dr. Arthur Bank continued his studies on the structure and organization of normal and abnormal human globin genes. With Dr. J. G. Mears he established the linkage of β and γ globin genes. Dr. Richard A. Rifkind, in collaboration with Dr. Paul A. Marks, studied the regulatory mechanisms in erythroleukemia cell differentiation and identified a period in G_1 or early S-phases of the cell division cycle critical for subsequent globin mRNA synthesis. Dr. John Lindenbaum studied granulocyte folate concentration in megaloblastic and iron deficiency anemias and the role of folate deficiency in the susceptibility to infection in alcoholism. With Dr. Vincent P. Butler, Dr. Lindenbaum has been developing a radioimmunoassay for vitamin K in biological fluids.

Dr. Karen L. Kaplan examined the release and subcellular location of platelet proteins including platelet factor 4, β -thromboglobulin, fibrinogen, factor VIII-related antigen and fibronectin. These observations have supported the hypothesis that thrombin generation in blood occurs at the platelet surface. Dr. Hymie L. Nossel and the Thrombosis Research Group continued the search for new tests for thrombotic disease. With Dr. Thomas Eckhardt he developed an assay for desarginyl fibrinopeptide B. Drs. John Owen and David Kvam have found elevated fibrinopeptide A levels in asymptomatic and symptomatic deep venous thrombosis and pulmonary embolism. Dr. C. Liu found that change in temperature alters thrombin fibrin-binding sites and affinity.

Dr. Harold Ballard continued his research activities in the design and development of Therapeutic Protocol for Eastern Cooperative Oncology Group for chronic lymphocytic leukemia. He maintained his interest in hemostatic alterations in prostatic cancer

and platelet dysfunction in myeloproliferative disease and continued to be productive in both areas.

Honors

Dr. John Lindenbaum served as Chairman of the Nutritional Anemias Subcommittee of the American Society of Hematology and was Visiting Professor at the University of Florida. Dr. Paul A. Marks served on the President's Commission on the Three Mile Island accident.

Dr. Harold S. Ballard continues his studies in the design and development of a therapeutic protocol for the Eastern Cooperative Oncology Group for Chronic Lymphocytic Leukemia, hemostatic alterations in prostatic cancer and platelet dysfunction in myeloproliferative disease.

Hormonal and Metabolic Division

Research Activities

Several clinical research studies involving an examination of the effects of the osteoclast inhibitor, dichloromethylene diphosphonate, in states of accelerated bone resorption were implemented by members of the Division. Drs. Ethel Siris and Robert E. Canfield, in collaboration with Drs. Elliott Osserman and William Sherman demonstrated that this agent is capable of inhibiting the bone erosion which characteristically accompanies multiple myeloma, and Drs. Siris and Canfield, in collaboration with Dr. George Hyman examined its effect in breast cancer metastatic to bone. Dr. Thomas Jacobs initiated a study to observe the effects of intravenously administered dichloromethylene diphosphonate in patients with hypercalcemia resulting from an underlying neoplastic disease. Drs. Canfield, Jacobs and Siris continued their long-term study on the effects of ethane-1-hydroxy-1, 1-diphosphonate in patients with Paget's disease.

Additional research projects incorporated diverse biochemical and immunochemical themes. Various fragments of peptides were purified in an effort to develop specific and highly sensitive radioimmunoassays. One series of studies was directed at the isolation and characterization of those fibrin-derived peptides which harbor the crosslinks introduced during thrombus formation. Dr. James Koehn purified the critical region which reflects gamma chain dimerization in the crosslinking process and worked on the development of a radioimmunoassay for this unique peptide. Similarly, Mrs. Joan Sobel, focusing on a polymer of alpha chains formed during the conversion of fibrinogen to fibrin, isolated and characterized its complex crosslink-containing moiety and initiated preliminary immunologic studies to

obtain a specific alpha-crosslink antibody. In studies with Dr. Hymie Nossel, a fragment from the B β chain of fibrin was determined to be of special clinical interest. A purification scheme using both classical chromatographic techniques and high performance liquid chromatography for the preparation of this fragment from human fibrinogen was developed by Dr. Steven Birken with the goal of generating a clinical radioimmunoassay for this early product of plasmin action. Dr. Birken also generated and characterized a variety of antisera specific for the hormone human chorionic gonadotropin (hCG). The sensitive and specific detection of hCG is crucial, not only for early detection of pregnancy, but also for measurement of ectopic hCG secretion by a variety of malignancies.

Dr. John P. Bilezikian and his associates conducted a series of investigations related to the mechanism of catecholamine action. With Dr. Gholamhossein Omrani he discovered a soluble cellular factor in rat erythrocytes that amplifies the actions of the catecholamines at the outer plasma membrane of the cell. Related studies with Dr. Elizabeth Shane were directed at the means by which this protein alters the coupling between beta receptors and adenylate cyclase activity. With Dr. Michael Schonberg, Dr. Bilezikian continued a study of the role of the catecholamines in growth and differentiation of myogenic cells in tissue culture. With Drs. Michael Rosen and Richard Robinson (Department of Pharmacology), he helped to establish a method by which primary myoblast cultures can be studied apart from fibroblasts. With Drs. Haruyasu Furukawa and John Loeb he studied ion transport in the turkey erythrocyte under conditions of hyperthyroidism and hypothyroidism. In addition, Dr. Bilezikian developed a radioreceptor assay to measure propranolol in the blood of patients, and with Dr. Shane and Ms. Carolyn Rochester (P&S '83) further developed the assay so that 4-hydroxypropranolol, an important metabolite, could also be detected.

Honors

Dr. Ethel Siris was selected by the Women's Medical Association of the City of New York to receive a Mary Putnam Jacobi Award. Drs. Siris and Thomas Jacobs were elected to membership in the Endocrine Society. Dr. Steven Birken presented a paper at the HCG Study Conference in Bellagio, Italy, at the invitation of the Population Council of the Rockefeller Foundation.

Immunology Division

Dr. Elliott Osserman has served as Acting Chief of the Immunology Division during Dr. Vincent But-

ler's sabbatical leave to work in the laboratory of Dr. Marc Feldmann in the Tumor Immunology Unit at University College, London.

Teaching

The expansion of knowledge in the field of Immunology has mandated an increasing allotment of teaching time and effort in the Immunology Section of Abnormal Human Biology for all members of this and related divisions. This responsibility has been shared by Drs. Leonard Chess, Steven Friedman, and Dorothy Estes of the Rheumatology Division and Drs. Benvenuto Pernis, David McConnell and Mark Hardy.

Research Activities

Dr. Elliott Osserman continued immunological investigations of multiple myeloma and related plasma cell dyscrasias. Dr. Osserman and Dr. Sherman pursued investigations to determine whether certain monoclonal immunoglobulins in myeloma and other plasma cell dyscrasias have their specific antigens and/or structurally related ligands already bound in their combining site(s) in their native, *in vivo* state. In one case where IgG^{Gar} bound riboflavin, this was conclusively established. Detailed physicochemical studies of IgG^{Gar} are being pursued in collaboration with Prof. Sherman Beychok of the Departments of Biological Sciences and Chemistry. Determination of the amino acid sequences of the heavy and light chains of IgG^{Gar} is being done in collaboration with Dr. Fred Garver of the Medical College of Georgia.

Dr. William Sherman and Dr. Elliott Osserman are attempting to define the pathogenic mechanisms in a group of patients with diverse neurological disorders, particularly polyneuropathies, associated with monoclonal gammopathies. A clinical trial of plasmapheresis has been carried out in collaboration with Dr. Marcel Olarte (Neurology). The monoclonal proteins from five of these patients have been studied in collaboration with Dr. Norman Latovitzki (Neurology), and Mrs. Joanna Shyong. Two of the five proteins had antibody-like activity against preparations of myelin, as demonstrated by complement fixation and/or immunoprecipitation.

Dr. Osserman continued his investigations of the enzyme, lysozyme, which is a major product of monocytes and macrophages. A principal question has been whether lysozyme effects specific glycoproteins or polysaccharides in mammalian cells and whether it participates in certain of the diverse immunological formations of monocytes and macrophages. The results of recent studies done in collaboration with Dr. John Rinehart of Ohio State Uni-

versity provide strong evidence in favor of these postulated roles of lysozyme. Specifically, lysozyme has been shown to markedly enhance monocyte-depleted mixed lymphocyte reactions. Lysozyme may therefore be an important mediator of the interactions between monocytes and lymphocytes in immunological functions. Further studies of the effects of lysozyme on these phenomena are being pursued in collaboration with Dr. James Halper, Dr. Leonard Chess and Dr. Harry Shen.

Honors

Dr. Osserman and Dr. William Sherman were awarded the title Knight Grand Commander of the Humane Order of African Redemption by the Republic of Liberia in recognition of the services rendered to the Hon. James Greene, former Vice President of Liberia.

Dr. Osserman was Visiting Professor of Medicine at the Mayo Medical School and Northwestern University, and he delivered the annual Waldenstrom Lecture in Malmo, Sweden. Dr. Osserman served on the Scientific Advisory Boards of the Institute for Cancer Research, Fox Chase, Philadelphia, and the Oklahoma Medical Research Foundation.

Division of Infectious Diseases

Teaching

Dr. Mark Goldberger joined the Division in July and was actively involved in its teaching program. The Division taught one of the sections in the second year course in Abnormal Human Biology. Monthly electives were offered at Presbyterian Hospital for four senior students and two residents, and senior elective courses are also offered at Hackensack Hospital by Dr. Peter A. Gross and at Stamford by Dr. Michael F. Parry.

A total of six fellows were trained in infectious diseases. Of these two have returned to Thailand as Assistant Professors of Medicine and one to Canada as Assistant Professor of Microbiology.

Symposia on antimicrobial therapy using β -lactam and aminoglycoside antibiotics were sponsored by the Division for which continuing medical education credits were obtained. All of the members of the Division were active in lecturing at hospitals throughout the United States as part of the CME programs.

A new journal club program was initiated in addition to the weekly Infectious Disease rounds.

Clinical Activities

Dr. Glenda J. Garvey continued as Director of the Medical Intensive Care Unit. The Division con-

ducted a large number of consultations on other services and one member of the group participated in the daily rounds in the Surgical Intensive Care Unit. Drs. Garvey and Harold C. Neu worked with the transplantation group in programs to avoid infection in these patients. Epidemiology activities were increased with more involvement in the surveillance of resistant bacteria and studies of the utilization of antimicrobial agents. Members of the Division served on the Antibiotics and Communicable Diseases Committee.

Research Activities

Clinical research studies were performed at Presbyterian Hospital of the clinical efficacy and safety of several new β -lactam antibiotics among which were piperacillin, an anti-Pseudomonas penicillin; and cefotaxime, a cephalosporin which inhibits both *Pseudomonas* and *Bacteroides* as well as β -lactamase producing *Enterobacteriaceae*. This agent was shown to penetrate the cerebrospinal fluid and was used to treat meningitis due to *Klebsiella* resistant to the available antimicrobial agents. Other studies involved an amidino penicillin, mecillinam, and a new oxa cephem.

A number of pharmacokinetic studies of novel cephalosporins were conducted in normal individuals and in patients with reduced renal function who were undergoing hemodialysis. The latter studies were done in collaboration with Dr. Gerald B. Appel of the Nephrology Division.

Therapeutic and pharmacokinetic studies of piperacillin were done with Dr. Alice S. Prince (Pediatrics) in patients with cystic fibrosis. The role of β -lactamase producing flora and anaerobic species on cure of pulmonary infections in patients with cystic fibrosis was evaluated.

A number of *in vitro* studies of the activity of new antimicrobial agents were performed. Of special interest were a fluorinated derivative of chloramphenicol which inhibited bacteria resistant to chloramphenicol, a 1-oxa cephem which was β -lactamase stable and inhibited the majority of the resistant bacteria encountered.

A rapid assay for determination of serum aminoglycosides was developed and was utilized in the hospital diagnostic laboratories, thereby providing more rapid serum level data.

Dr. Peter A. Gross (Hackensack Hospital) conducted studies on the response of patients to various influenza vaccines. He demonstrated that one high dose of a split-product influenza vaccine in unprimed children was adequately immunogenic and is non-reactogenic. These studies were conducted with Dr. William Davis (Pediatrics). Dr. Gross also investi-

gated the clinical efficacy of two new broader spectrum cephalosporins. Along with Drs. Neu and Prasit and Nalinee Aswapokee, Dr. Gross showed the importance of hospital acquired pneumonias in patients dying with nosocomial infections; urinary tract infections were relegated to a minor role.

Dr. Michael F. Parry (Stamford Hospital) worked out the epidemiology of *Citrobacter diversus* infections in neonatal care units. He also determined what part of the population lacks myeloperoxidase in their white blood cells and what types of infections they develop.

Honors

Dr. Neu was an invited speaker at meetings of the American Association of Academic Neurosurgeons, the American Gastroenterology Association, the American College of Physicians, the 10th International Latin American Congress of Microbiology in Santiago, Chile, and the 50th Anniversary of The Panamanian Medical Association. Dr. Neu was on the organizing committee of the 11th International Congress of Chemotherapy.

Dr. Gross, who was appointed to the editorial board of *Infection Control*, lectured at Johns Hopkins on his influenza studies and at the Center for Disease Control on deaths due to nosocomial infections. He also served as an ad hoc reviewer for the Microbiology and Infectious Diseases Advisory Committee, N.I.H.

Division of Metabolism and Nutrition

Research Activities

Dr. DeWitt S. Goodman and his colleagues in the Division of Metabolism and Nutrition continued to conduct major research activities in the fields of lipid metabolism, atherosclerosis, and the fat-soluble vitamins, A and D. During 1979 active progress was made in projects dealing with cholesterol turnover and metabolism in man; lipoprotein and apolipoprotein metabolism in man; platelet-derived growth factor; the metabolism and transport of vitamin A; and the transport of vitamin D in human plasma.

Studies on cholesterol turnover and metabolism in normal persons and in patients with hyperlipidemia were continued by Drs. Robert H. Palmer, Ralph B. Dell (Pediatrics), R. Ramakrishnan, and Goodman. A major scientific achievement of the past year, representing the culmination of almost a decade of work in this division, was the delineation of a confirmed set of predictive equations that describe some of the major parameters of body cholesterol metabolism in humans. These equations provide quantitative information about the production and body pools of cho-

lesterol in both normal and hyperlipidemic humans. This research has given us a much firmer quantitative understanding of body cholesterol metabolism and hyperlipidemia in humans.

Dr. Conrad B. Blum conducted research during the past year, in collaboration with Dr. Dell and Dr. Lieselotte Aron on the metabolism of apolipoprotein E (apoE), which is elevated in several atherogenic states and may play a role in the pathogenesis of atherosclerotic disease. A radioimmunoassay was developed for apoE, and information was obtained about the plasma levels and lipoprotein distribution of apoE in normal subjects and in patients with different types of hyperlipidemia. These studies, which are continuing, are adding valuable new information to our knowledge of the metabolism of this important apolipoprotein.

Blood platelet-derived growth-promoting factor (PDGF) is thought to play an important role in the pathogenesis of atherosclerosis by promoting arterial intimal smooth muscle cell proliferation and the development of early atherosclerotic lesions. Studies of PDGF have been conducted by Drs. Larry D. Witte, Arthur Chernoff, Goodman, and Ms. Barbara Linder (an M.D.-Ph.D. student). In collaboration with Drs. Karen L. Kaplan and Harvey J. Weiss, several lines of evidence were obtained that demonstrate that PDGF is localized in platelet α -granules. In collaboration with Dr. Richard F. Levine (Washington, D.C.) studies were conducted which strongly suggest that PDGF has its origin in the megakaryocyte. Further information was also obtained about the role of prostaglandin-related pathways in regulating the release of PDGF and other α -granule components. These studies were carried out in part in collaboration with Dr. Bengt Samuelsson of the Karolinska Institute in Stockholm, Sweden. Taken together, these studies of the physiology and biochemistry of PDGF add to our basic understanding of the atherogenic process.

Investigation dealing with the metabolism and transport of vitamin A were continued by Drs. John E. Smith, Noriaki Adachi, Mary Ann Gawinowicz, David Sklan (a visiting scientist from Israel), and Goodman. Major efforts continued to focus upon plasma retinolbinding protein (RBP), which transports stored vitamin A from the liver to the many peripheral tissues that require it to maintain differentiated structure and function. A major objective of this research is to elucidate the mechanisms that regulate RBP production and secretion by the liver. Thus, Dr. John E. Smith is studying in detail the events that occur in the liver cell during RBP production and secretion. Other studies explored the roles of various subcellular organelles and structures in the secretion

of RBP, in collaboration with Drs. Carmia Borek (Radiology) and Dianne Soprano. A major project is also in progress to examine some of the events that occur in peripheral tissues after vitamin A delivery. (Drs. Adachi, Sklan, Gawinowicz, and Goodman). Soluble, relatively small proteins with binding specificity for either retinol (vitamin A alcohol) or retinoic acid have been isolated from the cytosol of rat testis homogenates. The properties of these interesting proteins are being characterized in detail, and their possible physiological roles in modulating the biochemical expression of vitamin A activity inside cells will be explored. Finally, these studies may be relevant to a major effort here and in Europe to explore the potential use of vitamin A-related compounds (collectively termed retinoids) in the prevention of epithelial cancers in high risk patients.

Studies of the transport of vitamin D and 25-hydroxyvitamin D have been carried out by Dr. Masanobu Kawakami. This project aims to examine in detail the plasma protein, DBP, that transports vitamin D and its metabolites in human plasma. Information was obtained about the turnover and metabolism of DBP in normal human subjects, and about the effects of various chemical modifications of the structure of DBP upon its binding properties for 25-hydroxyvitamin D.

Studies on lipid metabolism and atherosclerosis in the Division of Metabolism and Nutrition comprise a major part of the program of the Specialized Center of Research (SCOR) in Arteriosclerosis at the Columbia-Presbyterian Medical Center. This Center, established and supported by SCOR grants from the National Heart, Lung, and Blood Institute in Bethesda, Md., represents one of eight such Arteriosclerosis Centers in the United States. The Columbia Arteriosclerosis Research Center comprises a multidisciplinary program of basic and clinical research directed at major questions in the areas of lipid metabolism, hyperlipidemia, atherosclerosis, thrombosis, and coronary heart disease. A central focus of this SCOR is the detailed and extensive study of patients with hyperlipidemia. Patients are seen and studied under the direction of Dr. Robert H. Palmer in a core clinic in the Atchley Pavilion that serves as an outpatient facility for clinical investigation of patients with hyperlipidemia. During the past year there were a total of approximately 1,400 patient visits to the SCOR clinic, involving approximately 300 patients. Other SCOR projects, being conducted in other Divisions of the Department of Medicine, include studies of (1) regional myocardial perfusion in patients with coronary atherosclerosis, being conducted by Dr. Paul J. Cannon and associates; (2) intravascular coagulation and thrombosis in patients

with hyperlipidemia or atherosclerosis, being conducted by Drs. Hymie L. Nossel and Kaplan and their associates; and (3) the intestine and high density lipoprotein metabolism, being carried out by Drs. Robert M. Glickman, Alan R. Tall, and their associates.

Honors

Dr. DeWitt S. Goodman, who was elected Chairman of the Council on Arteriosclerosis of the American Heart Association, served as a member of the Executive Committee of this Council and also as a member of the Board of Directors of the American Heart Association. Dr. Goodman was elected Chairman of the Advisory Board of the Deuel Conference on Lipids. He also served as a member of the Arteriosclerosis, Hypertension and Lipid Metabolism Advisory Committee of the National Heart, Lung and Blood Institute and continued to serve as Chairman of the Task Force on Lipid Metabolism of an NIH Evaluation of Endocrinology and Metabolic Diseases. Dr. Goodman continued as a member of the Advisory Board of the *Journal of Lipid Research* and was appointed and served as a member of the Editorial Board of the *Journal of Biological Chemistry*. Dr. Goodman was also a Councillor of the Harvey Society.

Dr. Robert H. Palmer was elected a Fellow of the Council on Arteriosclerosis of the American Heart Association and served as a member of the Committee on Diet of the New York Heart Association. He was a member of the Nominating Committee of the American Gastroenterological Association and served as a Consultant to the Endocrinologic and Metabolic Drug Advisory Committee of the F.D.A.

Dr. Conrad B. Blum was elected a Fellow of the Council on Arteriosclerosis of the American Heart Association.

Nephrology Division

Teaching

It is intended that the Renal Section of Abnormal Human Biology will be updated annually. This year's complete revision was well received by both students and instructors.

Clinical Activities

Dr. Gerald B. Appel reorganized the structure of the transplant-dialysis unit. Medical house staff now participate actively in the care of transplant patients. As a result of improved medical coverage the number of renal transplants performed in the past year has increased has nearly doubled. To date the graft survival has improved remarkably. The acute hemodialysis unit has also doubled its number of new patients.

Research Activities

Drs. Troy E. Dixon and Qais Al-Awqati found that the mechanism by which ion transport regulates cellular metabolism (the so called pacemaker effect of transport) is through changing the free energy of ATP hydrolysis in the cell. Drs. Herbert S. Chase and Al-Awqati determined that the sodium permeability of the luminal membrane is regulated by increasing intracellular sodium and calcium. Drs. Stephen Gluck and Al-Awqati found that the mechanism by which antidiuretic hormone increases water permeability is by inducing aqueous channels in the luminal membrane. Dr. Appel continued his studies on the pharmacokinetics of drugs in renal failure and initiated research on experimental drug induced interstitial nephritis.

Dr. Jay I. Meltzer established that patients with the nephrotic syndrome comprise a heterogenous group with respect to their plasma volume and renin activity. The results suggest that the cause of edema in nephrotic patients with minimal change disease is due to intravascular volume depletion secondary to hypoalbuminemia while in patients with membranous nephropathy it is due to primary salt retention by the kidney, perhaps because of decreased filtration rate.

Drs. Juan Oliver and Paul Cannon found that modest sodium depletion increases renal prostaglandin E_2 synthesis without any changes in renal blood flow. They further determined that prostaglandins are involved in the changes in renal blood flow seen in acute heart failure. They also demonstrated that the overflow of norepinephrine into the renal circulation was an index of the frequency of discharge of the renal sympathetic nerves. Finally, they established that the modulating effect of renal prostaglandins on the renal nerves is not due, as had been thought, to inhibition of norepinephrine release.

Oncology Division

Teaching

Dr. Rose Ruth Ellison undertook, with Drs. I. Bernard Weinstein, Martin Oster, Marjorie Perloff, William Sherman, Thomas Garrett (Harlem Hospital), Chu Chang (Radiology), Irene Seeland (Psychiatry), and Frederick P. Herter (Surgery) a major revision of the oncology syllabus for the second year Abnormal Human Biology course.

Dr. Ellison directed the newly formed Columbia Presbyterian Medical Center Cancer Committee which is responsible for educational programs, Tumor Registry organization and audits of the quality of cancer care throughout the hospital. Dr. William Sherman, serving as part of an interdisciplinary triumvirate reorganized the weekly Medical Center

cancer conference. Other teaching activities undertaken by the division included a weekly research conference and a teaching conference for the hematology-oncology fellows. A subinternship in oncology was initiated and twice-weekly oncology chief teaching rounds continued. Dr. George Hyman held a weekly oncology conference for the medical housestaff rotating through the Harkness Scatter Service.

Drs. Hyman, Ellison, Esteban Cvitkovic, Weinstein and others all participated in the Columbia University Comprehensive Cancer Center Cancer Control Program through lectures and conferences at various hospitals. In addition, Dr. Hyman participated with Dr. James Wolff in the new educational program on Cancer with the Comprehensive Cancer Center. He also participated in several television reports relating to the treatment of cancer, particularly lymphosarcomas and Hodgkins Disease.

Clinical Activities

With the aim of incorporating as many patients as possible into clinical treatment protocols, many interdisciplinary working groups were formed. Chemotherapeutic studies for stages II, III and IV breast cancer were coordinated by a group consisting of Drs. Perloff, Oster, and Ellison and Drs. Frank Gump, Sven Kister, Paul Lo Gerfo and Avram Cooperman (Surgery). Several of these protocols were institutional studies; others were those of the Cancer and Leukemia Group B. Dr. Perloff, who plays a major role in the cooperative group breast cancer studies, joined the Oncology Division during the year. Studies in ovarian cancer, cancer of the prostate and bladder were undertaken in conjunction with Drs. Eduardo Yordan and Henry Clay Frick III (Obstetrics and Gynecology), and Drs. Nicholas Romas and Ralph Veenema (Urology). Dr. Martin Oster assumed responsibility for studies in head and neck cancer, in cooperation with Drs. Andrew Blitzer and Maxwell Abramson (Otolaryngology). Dr. James Halper, Ellison, Garrett (Harlem Hospital), Arthur Karanas (Roosevelt Hospital) and Daniel Knowles (Pathology) began to coordinate treatment plans and correlation of these with marker studies in patients with lymphoma.

Dr. Halper, together with Dr. Knowles, instituted a program to make immunological typing of leukemias and lymphomas available to the Medical Center. Immunological classification has been shown to have prognostic significance. In 1979 lymphocyte specimens from over fifty patients were typed.

Dr. Sherman maintained administrative responsibility for the clinical cancer research facility on PH 4-East.

Research Activities

Dr. Ellison identified the use of intensive maintenance therapy as a major factor in providing long continuous remissions in patients with acute myelocytic leukemia. Other expected prognostic features were not shown to be operative in those patients who receive marrow suppressive treatment with an anthracycline and arabinosyl cytosine. This analysis continues. Dr. Ellison prepared a group protocol for treatment of adults with acute lymphocytic leukemia.

Dr. Elliott Osserman continued to direct the Myeloma Program Project which is a coordinated program of clinical and immunological investigations of multiple myeloma and related plasma cell dyscrasias. Dr. Osserman was selected by the American Cancer Society to supervise the multi-institutional study of the therapeutic value of human leukocyte interferon in myeloma. Dr. William Sherman collaborated in this project, and all CPMC patients were studied in the Clinical Cancer Research Center of the General Clinical Research Center. The availability of these facilities was a major factor in the successful pursuit of these investigations. Drs. Osserman and Sherman also collaborated with Drs. Ethel Siris and Robert Canfield in a study which clearly demonstrated the efficacy of dichloromethylene diphosphate in the management of hypercalcemia and negative calcium balance in patients with multiple myeloma.

Dr. Halper studied the expression of two lymphocyte markers, Ia antigens and α -naphthyl acetate esterase in great detail and compared to that of other markers. These markers were useful in identifying different phenotypes in lymphomas from different patients. Specimens from some patients contained cells with different phenotypes, leading to speculation that lymphomas from these patients consisted of cells at different stages of differentiation. During the course of these studies several antigen binding lymphomas and several lymphomas reactive to mitogens were identified. The reactivity of these lymphomas was further characterized in collaboration with Dr. Leonard Chess (Rheumatology).

Dr. Peter Byeff, working in Dr. Halper's laboratory, identified several cases of myeloma in which the neoplastic plasma cells and peripheral blood lymphocytes showed chromosomal abnormalities. Further characterization of the nature of the cell undergoing malignant transformation in myeloma has been undertaken. Several cell lines with unusual characteristics were established from myeloma patients and are currently being further characterized.

Dr. I. Bernard Weinstein and his associates continued their studies on the molecular and cellular mechanisms of action of chemical carcinogens.

Studies done together with Dr. Dezidur Grunberger and Dr. Alan M. Jeffrey (Public Health Division of Environmental Sciences, and Institute of Cancer Research) focused on the structural and functional changes in DNA when modified by the ubiquitous environmental carcinogen benzo(a)pyrene. Their results provided insights into multifactor interactions and multiple steps in the action of environmental carcinogens. Rapid *in vitro* bioassays were also developed for the detection of chemical carcinogens and tumor promoters in the human environment.

Honors

Dr. Ellison was named the American Cancer Society Enid A. Haupt Professor of Clinical Oncology. She continued as a member of the Board of Scientific Counselors of the Division of Cancer Treatment, National Cancer Institute and served on the editorial boards of *Blood* and the *American Journal of Medicine*. She also completed a term on the World Committee of the International Association for Comparative Research on Leukemia and Related Diseases.

Dr. Oster completed his third year as a Junior Faculty Clinical Fellow of the American Cancer Society and Dr. Sherman was named a Junior Faculty Clinical Fellow.

Dr. I. Bernard Weinstein was appointed to the National Committee on Cancer Prevention and Detection of the American Cancer Society, the Mott Prize Committee of the General Motors Cancer Research Foundations, the Board of Scientific Counselors of the Division of Cancer Cause and Prevention of the National Cancer Institute, the Scientific Advisory Committee of the Northwestern University Cancer Center, the Advisory Board of the Chemical Industries Institute of Toxicology, the Advisory Board of the Banbury Center of the Cold Spring Harbor Laboratory, and the External Scientific Review Committee of the Imperial Cancer Research Fund in London. He served as chairman of the 1979 Gordon Cancer Conference and presented invited lectures at the Princess Takamatsu Symposium on Cancer Research in Tokyo and the International Conference on Environmental Carcinogens in Amsterdam. He continued to serve on the Scientific Council of the International Agency for Research on Cancer in Lyon, the Visiting Committee of the Biology Department of Brookhaven National Laboratory, the Scientific Advisory Committee of the Sidney Farber Cancer Institute of Harvard University, the External Review Group of the McArdle Laboratory of the University of Wisconsin, and as Member of the Institute of Medicine of the National Academy of Sciences. He also continued on the editorial board of the *Chemico-Biological Interactions* and as associate

editor of the *Journal of Environmental Pathology and Toxicology*.

Pulmonary Division

Teaching

The appointment of Drs. John R. Edsall and Byron M. Thomashow to the staff during the past year permitted expansion of the teaching program for both students and housestaff.

Research Activities

Dr. Norma M. T. Braun continued her investigation of respiratory muscles in patients with chronic obstructive pulmonary diseases and those with neuromuscular disorders. These studies indicate that fatigue of respiratory muscles may play a role in abnormal gas exchange. Indices which may permit early detection of respiratory muscle dysfunction and institution of supportive measures to prevent the onset of respiratory complications are now being developed.

Drs. Hylan A. Bickerman and John M. Rodgers continued their studies on the mechanics of respiration with flow volume tracings and body plethysmography. By obtaining the flow rates at 50 and 25 percent of total lung volume, they estimated the major flow limiting segment of the tracheobronchial airway in various obstructive diseases. With Dr. E. Leslie Chusid (Mt. Sinai Medical School), the effectiveness of a number of antitussive agents including caramiphen, carbapentane, tussionex and a number of volatile oils such as eucalyptus were investigated in acute and chronic cough by computer analyses of tape recordings.

Dr. Peter R. B. Caldwell spent a sabbatical year in the Medical Unit Laboratory of St. Mary's Hospital, University of London under the direction of Professor W. Stanley Peart. Dr. Caldwell worked with Dr. Giuseppe Sagnella on the subcellular localization of kidney renin to examine mechanisms of release of this enzyme.

Dr. Randolph P. Cole and Dr. Caldwell collaborated with Dr. Beatrice A. Wittenberg and Dr. Jonathan B. Wittenberg (Albert Einstein College of Medicine) to investigate isolated mitochondrial function at low oxygen levels and to examine the effect of myoglobin on mitochondria under these conditions. These studies are directed toward elucidating an understanding of the utilization of oxygen by muscles in the presence of a reduced oxygen supply.

Drs. Yale Enson, Réjane M. Harvey and John A. Wood continued a study of the effect of changing heart rate on the pulmonary circulation in dogs with

complete heart block while the heart was paced electronically at slow and rapid rates. Rapid heart rates produced an increase in pulmonary arterial blood volume and blood pressure which is not related to changes in the functional characteristics of the vessels. These findings suggest that evaluation of the circulatory response to drugs or to exercise should consider the effect of such interventions on the heart rate.

Drs. Enson, Harvey, Henry M. Thomas III and Wood also examined the effect of interstitial lung diseases on the vasoconstrictive properties of the pulmonary arterial tree. This study was initiated because the ability of the pulmonary arteries in patients with chronic diffuse interstitial lung diseases to vasoconstrict during alveolar hypoxia appeared to be impaired. They found no significant difference in response to hypoxia in an animal model of the disease and normal dogs.

Dr. Thomas also found that in dogs with disease, as in normal dogs, alveolar hypoxia altered the distribution of perfusion relative to ventilation in a manner which further lowered arterial oxygen tension.

Dr. Gerard M. Turino with Drs. Richard S. Kornbluth, Michael J. McNamee and Ines Mandl (Obstetrics and Gynecology) have demonstrated the presence of a macrophage cell line isolated from bronchoalveolar lavage from normal human lungs. This cell has survived over one and one half years and 50 passages. Secretion of elastase and collagenase has been demonstrated and the relation between this macrophage line and other macrophage forms is being investigated.

Dr. S. M. Kamal Batcha, with Dr. Turino and Drs. S. Alex Stalcup (Pediatrics) and Robert B. Mellins (Pediatrics), extended the study of the effects of pathophysiological mechanisms on converting enzyme function of the lung. Their observations offer an explanation for the previously recognized predisposition to systemic hypotension which occurs in patients with chronic obstructive lung disease. The study is now being extended to the effects of hyperoxic exposure in dogs. The pulmonary endothelial cell is a prime target for such lung cell injury and could contribute significantly to the pathophysiological effects of high oxygen on the lung and cardiovascular system.

Dr. Jerome O. Cantor (Pathology) with Drs. Bonnie A. Bray, Karl Meyer (Ophthalmology), Mandl and Turino demonstrated that lung glycosaminoglycan synthesis is increased after the induction of interstitial pulmonary fibrosis by bleomycin administered intratracheally in hamsters. The results observed indicate that changes in glycosaminoglycan synthesis and degradation may

reflect more generalized responses to cell injury and repair rather than the specific causative agent itself.

Dr. Tukaram V. Darnule (Obstetrics and Gynecology) with Drs. Mandl and Turino continued to develop a sensitive, immunological assay for detection of elastin peptides and elastin peptide antibodies in serum of patients with pulmonary emphysema. Success of such an assay has the prospect of providing early biochemical diagnosis of pulmonary emphysema prior to physiological or even clinical manifestations of airway obstruction.

Dr. Joseph M. Cerreta in collaborations with Drs. Mandl and Turino is defining alveolar elastin fiber structure and disposition in mammalian lung with specific reference to changes after experimental elastase injury, which are being correlated with measured loss of parenchymal recoil pressure. Such data will provide insight into micromechanical alterations at the alveolar level in pulmonary emphysema.

Dr. Arline D. Deitch (Pathology) in collaboration with Drs. Mary S. Parshley, Mandl, Cerreta and Turino attempted to develop a clone of human pulmonary artery endothelial cells and smooth muscle to study their capacity for elastin synthesis as part of the connective tissue repair process in lung cell injury. At present, specific cellular sources of lung elastin are unknown.

Dr. Mohamed M. Osman with Drs. Stephen Keller (Obstetrics and Gynecology), Meyer and Turino studied the sequence of degradation of lung elastin during continuous perfusion with elastase perfusates in dog lungs to define the sites of primary elastin degradation in lung parenchyma from enzyme delivered intravascularly. Results determined from intravascular delivery of enzyme will be compared with effects of elastases administered intratracheally.

Dr. Bray with Dr. Turino extended her studies of fibronectin, a newly recognized tissue component of lung interstitium and basement membrane. She has demonstrated that lung parenchyma has at least two peptides which react with antifibronectin antisera. With Dr. Gabriel C. Godman (Pathology), she is applying immunocytological techniques to define more precisely the cellular and interstitial sites of fibronectin in lung parenchyma in the normal state and in experimentally induced pulmonary emphysema and fibrosis.

Dr. Turino in collaboration with Drs. Richard M. Skalak (Civil Engineering), Maciej P. Bieniek (Civil Engineering) and Cerreta are refining a three-dimensional computer programmed model of human lung with respect to alveolar surface properties and alveolar septal elastin and collagen tissue stresses to define the structural predisposition to proteolytic injury to the alveolus and the consequences for whole

lung pulmonary mechanics. Elastin reinforcements at the aperture of alveoli from the alveolar duct may be especially vulnerable structural site for the formation of pulmonary emphysema from elastase injury.

Honors

Dr. Peter R.B. Caldwell was invited to lecture at Oxford University, the Cardiothoracic Institute of the National Heart Hospital of the University of London, the University of Bern and the University of Zurich during his sabbatical leave.

Dr. Réjane M. Harvey became a member of the Pulmonary Diseases Advisory Committee, NHLBI and the Council of Scientific Advisors of the Parker B. Francis Foundation.

Dr. Henry M. Thomas III was elected Secretary-Treasurer of the New York Trudeau Society.

Dr. Gerard M. Turino was elected President-Elect of the New York Heart Association, served as a member of the Executive Committee of the Cardiopulmonary Council and of the Research Committee of the American Heart Association, and the Board of Directors and Program and Budget Committee of the New York Lung Association. He was appointed member of the Program Project Committee A of the National Heart, Lung and Blood Institute and consulting editor of the *American Journal of Medicine*. Dr. Turino was an invited speaker and participant in the Gordon Conference on Lung Elastin, the National Institutes of Health Workshops in Lung Water and in Micromechanics of the Lung. He was Visiting Professor of Medicine, University of Illinois, and invited lecturer at Downstate Medical Center, New York Medical College, Lenox Hill Hospital and the Annual Meeting of the College of Chest Physicians. Dr. Turino was awarded the Silver medal of the P&S Alumni Association for his activities in the Medi/Center I campaign.

Rheumatology Division

Teaching

The training program under the auspices of the Division of Rheumatology offered elective programs for fourth year medical students, senior medical residents and a postdoctoral training program for fellows in clinical rheumatology and immunology. Teaching efforts expanded in 1979 to include: 1) the introduction of a series of lectures to house officers and fourth year students on the cellular basis of the immune response and its relation to autoimmune phenomenon, and 2) didactic and laboratory sessions in clinical immunology to familiarize students with clinical immunologic techniques including enumeration

of T and B lymphocytes in peripheral blood, immunofluorescent methodology and the measurement of cell mediated immune responses *in vitro*. In addition, the division increased its role in the teaching of the Immunology Section of the Abnormal Human Biology course which now includes separate lectures on T cell differentiation, systemic lupus erythematosus (SLE), rheumatoid arthritis, systemic vasculitis and immune complex disease. Finally, Dr. Dorothy Estes, who was appointed consultant in rheumatology at the Harlem Hospital, also organized a weekly seminar on Current Topics in Immunology.

Clinical Activities

The Division of Rheumatology coordinated its clinical programs with the pediatric program in Rheumatology under the direction of Dr. Jerry C. Jacobs so that undergraduate and graduate trainees have the opportunity to participate in the care of children as well as adults with rheumatic disease. In addition, the division expanded its utilization of the Clinical Research Center to evaluate new treatment modalities in patients with systemic lupus erythematosus and for detailed clinical investigative studies of patients with a variety of autoimmune diseases. In particular, a new protocol to evaluate the role of plasmapheresis and leukopheresis in the management of rheumatoid arthritis and SLE was initiated.

Research Activities

Dr. Leonard Chess, who is particularly interested in isolating subclasses of human T cells important in the regulation of the immune response, investigated the differentiation history of human T cells. Efforts were directed to the identification of distinct and unique differentiation antigens which distinguish subclasses of lymphocytes and which may allow for their identification and isolation for immunologic functional analysis. Dr. Chess utilized the technique of somatic cell hybridization to raise monoclonal antibodies which recognize distinct T cell subclasses. The capacity to isolate distinct populations of regulatory cells in human peripheral blood will allow for greater understanding of abnormalities in the control of immune response thought to be important in the pathogenesis of a number of rheumatic diseases including rheumatoid arthritis and systemic lupus erythematosus. Interestingly, some patients with autoimmune disease have antibodies in their sera reactive with subpopulations of lymphocytes. In addition, Dr. Chess's laboratory studied the functions of gene products of the major histocompatibility complex including the HLA in man. This genetic region is responsible, in part, for controlling immune response.

siveness to a variety of antigens including regulation of the immune response to self determinants. Since the HLA region is known to be associated with a variety of rheumatic diseases including ankylosing spondylitis and rheumatoid arthritis, precise analysis of these genes will aid in our understanding of the mechanisms involved in the pathogenesis of these diseases.

Dr. Steven M. Friedman's laboratory is intimately involved in studying the mechanisms by which T lymphocytes recognize foreign or altered-self cell surface determinants and subsequently differentiate into killer cells capable of destroying these foreign cells. Dr. Friedman also is studying the mechanisms by which, under certain experimental conditions and in some diseases in man, these same T cells become autodestructive and destroy unaltered normal cells. In addition, Dr. Friedman is actively investigating the mechanisms by which human antibody-forming cells become unresponsive (tolerant) to given antigens.

Dr. Jane H. Morse continued her studies of naturally occurring immunosuppressive factors in plasma. In collaboration with DeWitt Goodman and L. Witte, it has been shown that all normal classes of lipoproteins in physiological concentrations inhibit lymphoproliferation *in vitro*. In addition, Dr. Morse is studying aberrations of cellular immunity in progressive systematic sclerosis and mixed connective tissue disease.

Dr. Dorothy Estes, in collaboration with Drs. Gail Williams, Jay I. Meltzer, Conrad L. Pirani and Fred G. Silva, continued to study the relationship of renal biopsies to clinical course in patients with systemic lupus erythematosus and nephritis. The group has found that the overwhelming majority, if not all patients, with systemic lupus have evidence of renal abnormalities in early stages of their disease and that certain patterns seen, either by immunofluorescence, electron microscopy or light microscopy, may have prognostic significance for patients. In collaboration with Dr. Karen Kaplan (Hematology), Dr. Estes found that an analog of aspirin (salsalate), unlike aspirin, does not increase bleeding time or inhibit platelet aggregation.

Dr. Israeli A. Jaffe continued his pioneering studies of the role of penicillamine in rheumatoid arthritis. In collaboration with Dr. Parvin Merryman, he also examined the effects of penicillamine on lymphocyte function in man.

Honors

Dr. Chess was a member of the American Association of Immunologists, the Merit Review Board in Immunology for the Veterans' Administration and the Immunobiology Study Section of the NIH. He

was appointed to the medical advisory board of the SLE Foundation and as associate editor of *Thymus*. In addition, Dr. Chess was program chairman of the Immunology Section of the National American Rheumatism Association Meetings in Denver.

Dr. Morse was a member of the Allergy and Clinical Immunology Research Committee of the NIAID and a member of the editorial board of *Arthritis and Rheumatism*. She is president-elect of the New York Rheumatism Association.

Dr. Estes was elected vice president of the New York Rheumatism Association and was appointed to the medical advisory board of the SLE Foundation.

Mary Imogene Bassett Hospital

Eleven senior electives including a medical subinternship, two outpatient general medical programs and eight subspecialty electives were offered during the past academic year. A new elective was clinical endocrinology. A total of 87 student months (83 from P&S) was spent on these electives.

Admissions to the Medical Service totaled 2108. In addition, there were 30,500 visits to the various general medicine and subspecialty clinics. A nurse clinician was added to assist with inpatient and outpatient diabetic patient care.

Dr. Gary Hoffman initiated a study of Ankylosing Spondylitis, *An Analysis of Neurogenic Factors*, in a dog model with the cooperation of Drs. Robert Mackie and Walter Franck.

Dr. Walter Franck with Dr. Lorne Runge participated in a double blind study of the effectiveness of Levamisole in Rheumatoid Arthritis. With Drs. Gary Hoffman and William Streck, Dr. Franck also initiated a study on estrogen levels as a function of disease activity in systemic lupus erythematosus. With Dr. Peter Schur, he studied a family with SLE, IGA deficiency, and Fitzgerald deficiency. In association with Dr. Salvatore DiMauro, he also investigated a family with myoadenylate deaminase deficiency.

Dr. Gary Weaver identified a patient with a previously described electrophoretically silent, high affinity hemoglobin variant with iron overload. He is now studying family members to define the abnormality in more detail.

Harlem Hospital Center

Teaching commitments continued for Introduction to the Patient, the major clinical year Medical Clerkship, and numerous fourth-year electives. Many students from Columbia University as well as many from other medical schools enrolled in electives at

Harlem Hospital Center. For the ninth consecutive year, the Department provided structured summer externships for nine third-year students from other medical schools. Teaching was also provided for Physicians' Assistant students from the City University of New York Biomedical Program. Postgraduate education was provided for 87 house officers and fellows, a group comprised of graduates of 32 United States medical schools.

Dr. P. C. Taylor Dickinson, in association with Drs. Cynthia Wong, Barbara Dangman (Pediatrics) and Angus Sampath (Pathology), studied the distribution of protective antibodies to various *Neisseria meningococcal* serotypes. With Drs. Jeanne A. Smith, Charles P. Felton, Hazeline M. Nurse, and Angus Sampath, Dr. Dickinson began a prospective evaluation of pneumococcal vaccine in an urban population.

Dr. Donald Feinfeld, with Drs. Anne M. Briscoe, Patricia M. Hart, Hazeline Nurse, and Gerald Thomson, studied serum and urine myoglobin levels in azotemia and in patients undergoing dialysis therapy. With Drs. Irwin M. Arias and Gerald Fleischer (both of the Albert Einstein College of Medicine), Dr. Feinfeld has continued his investigation of urinary ligandin in acute renal failure, including aminoglycoside and radiocontrast media toxicity. Ligandinuria may be a useful marker in acute renal failure. In collaboration with Drs. Marie F. Gade and Ronald M. Gade (both from New York Medical College), Dr. Feinfeld continued studies of microradiographed nephrons in various models of renal disease. In addition, Dr. Feinfeld, working with Drs. Jeanne Hotchkiss, Hazeline Nurse, Jeffrey Hammer (Psychiatry) and Anthony Villamena (Psychiatry) is reviewing the psychological factors affecting uremic heroin addicts and the impacts of these factors on survival.

Dr. Felton, together with Dr. James Chien, continued a collaborative United States Public Health Service study of the efficacy of short-course (six months) chemotherapy for pulmonary tuberculosis. With Dr. Yasoma Challenor (Rehabilitation Medicine) and Dr. John C. Brust (Neurology), Dr. Felton studied nerve conduction velocities and quantitative neural function in patients with sarcoidosis. Subclinical peripheral nerve involvement, featured by low sensory neural amplitudes, has thus far been found to be common in their studies.

Dr. John Lindenbaum continued his studies of digoxin metabolism and absorption. In collaboration with Drs. Vincent P. Butler, Jr., Jay Brown and Sara Levitan, it was found that more than 20% of patients receiving chronic digoxin therapy excreted substantial amounts of a cardioinactive metabolite, dihydrodigoxin.

With Dr. Paul Wissel, evidence was found that the process of forming this metabolite is inducible in patients undergoing digitalization. With Drs. Dial Hewlett and Deborah Rund, studies of the possible site of formation of the metabolite were begun. With Dr. Ruben Cuadrado, the absorption of encapsulated liquid digoxin concentrates was studied in human volunteers. With Dr. Charles Gerson (Mount Sinai School of Medicine) it was found that digoxin tablet absorption in patients who had intestinal bypass operations was directly related to the length of remaining jejunum. Dr. David Savage and Dr. Lindenbaum continued their studies of the relationship of folate deficiency to infection in alcoholics. Dr. Eric Hardt and Dr. Lindenbaum, in a study of 350 patients with anemia, found the serum ferritin to be superior to the iron/iron binding capacity as a diagnostic test.

Dr. Jeanne Smith, together with Dr. Doris Wethers (Pediatrics, St. Luke's Hospital) and Drs. Arthur Bank, Yusef Khakoo (Pediatrics) and Sergio Piomelli (Pediatrics), continued her participation in a nationwide, five-year prospective study of the complications of sickle cell disease.

There were 5,106 admissions. The reallocation of beds at Harlem Hospital Center resulted in the addition of general medical beds to create a total of six general medical wards. Together with intensive care, extended care, maintenance dialysis, and tuberculosis beds, the 246-bed Medical Service continues to be one of the largest in the City of New York.

Dr. David J. Clain, formerly from the Groote Schuur Hospital, Cape Town, South Africa, was appointed Chief of the Division of Gastroenterology. Dr. Thomas J. Garrett, also from the Memorial Sloan-Kettering Cancer Center, was appointed to coordinate Oncology services.

Harlem Hospital Center received an Urban Health Initiative Award of approximately 1.25 million dollars. The award will assist in the establishment of four Urban Primary Care Satellite Centers in the Central Harlem area. The Centers will form the nucleus of an outreach health care network based at Harlem Hospital Center and staffed primarily by graduates of the hospital's house staff training programs. Drs. Gerald E. Thomson, Thomas J. Mattimore, and Jay Dobkin are participating in the planning for the network.

Plans are also proceeding for a new ambulatory care building to be erected shortly at Harlem Hospital Center which will house modern emergency room and clinic facilities.

Honors

Dr. Anne M. Briscoe served as President of the Association for Women in Science Educational

Foundation, Treasurer of the Federation of Organizations for Professional Women, and as Chairwoman of the Women in Science Committee of the New York Academy of Sciences. Dr. Birscoe also served as Representative of the Association for Women in Science to the United Nations Non-Governmental Organization and as a Commissioner of the New York City Commission on the Status of Women.

Dr. Charles P. Felton served as Chairman of the Task Force on Tuberculosis of the State of New York, Chairman of the Memorial Lecture Committee of the American Thoracic Society—American Lung Association Annual Scientific Program, Counselor-at-large of the American Thoracic Society and member of the Board of Directors of the American Lung Association. In addition, Dr. Felton served as a member of the Board of Directors of the New York Lung Association and the Council of Lung Associations of New York State.

Dr. John Lindenbaum served on the Peer Review Board of the National Council on Alcoholism.

Dr. Jeanne A. Smith served as a member of the Blood Diseases and Resources Policy Board of the National Heart, Lung and Blood Institute.

Dr. Gerald E. Thomson served as Chairman of the New York Heart Association's Committee on Hypertension and as a member of the Board of Directors of the New York Heart Association. Dr. Thomson was Chairman of the statewide Hypertension Programs and Resources Committee of the New York State Department of Health's Bureau of Chronic Diseases, a member of the Advisory Committee on Hypertension to the New York State Department of Health, a member of the Health Research Council of the State of New York, and a member of the Advisory Board of the Kidney Foundation of New York. In addition, he served as a member of a National Heart, Lung and Blood Institute Committee to review a National Study of Systolic Hypertension in the Elderly, as a member of the Medical Advisory Council of the School of Biomedical Education of the City University of New York, and as a member of the United State Senate's Blue Ribbon Panel to review the National High Blood Pressure Education Program. He was appointed to a National Heart, Lung and Blood Institute Committee to review a Multicenter Trial on the Nonpharmacological Treatment of Hypertension.

Morristown Memorial Hospital

The trustees and the staff of the Morristown Memorial Hospital greeted the signing of the formal affiliation agreement with the College of Physicians and Surgeons of Columbia University with great en-

thusiasm. All look forward to meaningful involvement in medical student and resident teaching programs and participation with the faculty in development of innovative and constructive clinical and research efforts.

As a first step in the affiliation process with P&S, coordination of subspecialty rounds and rotations between Morristown and Overlook Hospitals was begun for both residents and staff physicians. The initial efforts in this exchange were in the area of Infectious Diseases. Dr. Albert S. Klainer, Chairman of the Department of Internal Medicine of Morristown Memorial Hospital and Head of the Division of Infectious Diseases, made teaching rounds at Overlook and several PGY-3 residents from Overlook rotated through the Division at Morristown. New teaching programs are currently being explored in field of geriatric medicine, ambulatory care practice, and primary care including ambulatory ophthalmology, gynecology, otolaryngology and dermatology.

The Medical Service including the Divisions of Family Practice and Neurology admitted more than 7200 patients in 1979. In addition, 4824 clinic visits were recorded with 1591 of these in Allergy Clinic and 1101 in the General Medical Clinic.

Dr. Klainer of the Division of Infectious Diseases obtained research funding to evaluate a) Legionnaires disease in the immunosuppressed patient; b) the combination of sulfadiazine-trimethoprim in the treatment of chronic urinary tract infection and prostatitis; c) LY-127935, a new cephalosporin active against *Pseudomonas aeruginosa*; d) Piperacillin and e) Mecillinam in the treatment of acute gram-negative rod infections.

Overlook Hospital

Continued emphasis on the training of the primary care internist constituted the major educational commitment of the Department of Medicine at the Overlook Hospital. House Staff members and full-time faculty have once again identified volunteer departmental members with great strengths and skills in the pragmatics of bedside teaching. These men and women are responsible for acting as direct supervisors and role models in the medical residency program. The teaching service has expanded to include the isolation unit and additional patient care floors. Approximately 85% of all private patients with a primary medical problem are now directly involved with the resident staff. Sub-specialty teaching conferences have been integrated with the formal American Board of Internal Medicine recertification review.

The primary care training grant was extended another year by the Department of Health Education and Welfare, Bureau of Health Manpower. Two primary care satellites have been formalized and construction has begun on the western satellite in Warren Township. These office practices will be manned by academic practicing internists and pediatricians and will fully integrate the resident staff in a longitudinal care office experience. The traditional clinic will slowly be phased out. Faculty have been identified and the first program should be functioning in the spring of 1980.

The use of video tape playback has become an increasingly powerful modality in teaching outpatient interviewing techniques. By watching his/her own performance with a skilled psychosocial teacher, the resident physician is made acutely aware of attitudes and behavioral patterns which either strengthen or weaken the ability to take a comprehensive and sophisticated history.

A program for recertifying all staff members in cardiopulmonary resuscitation was successfully launched this past summer during an intensive 10 week course in emergency medical care for house staff and practicing physicians.

Many resident physicians have now been trained as cardiopulmonary resuscitation (CPR) instructors and are involved in a massive community effort at training 20% of the adult and adolescent population in the communities served by Overlook.

The Family Practice Residency was awarded additional funding from the Department of Health, Education and Welfare. Their model office practices continued to emphasize total patient care with the sophisticated use of appropriate ancillary services such as Home Care, Hospice, and Patient Education.

The Overlook Hospital Mobile Intensive Care Unit which has been operating as a pilot project under the New Jersey State Department of Health has now completed four years of operation. During this period of time, over four thousand calls have been made by the unit. Both units have full radio and telemetry capability and are staffed by a driver and two paramedics or a driver, a paramedic and a house staff officer assigned to the unit. All clinical encounters are taped and made available for later review by participants and supervising faculty. Patient statistics include: Admissions—4,065; Deaths—282; Autopsies—85.

The leading diagnosis in patients admitted to the Medical Service in order of frequency were: Chronic Ischemic Heart Disease, Acute Myocardial Infarction, Pneumonia, Cardiac Failure, Diabetes Mellitus, Liver Disease, Malignancies (breast, lung, and colon) Chronic Obstructive Lung Disease, and

Hematological Disorders (Anemia and Lymphoma).

The Beta Blocker Heart Attack Trial sponsored by the National Heart Lung and Blood Institute is in its 2nd year of a 5 year multicenter study. The purpose of this program is to ascertain the efficacy of Propranolol in the secondary prevention of myocardial infarction.

Treadmill studies to evaluate a new Beta Blocker, Pindolol, are continuing in the cardiopulmonary laboratory.

Honors

Dr. William F. Minogue was appointed president elect of the Academy of Medicine of N.J.

Dr. Michael Bernstein was elected Governor of the American College of Physicians for the State of N. J. He was also reappointed to the Executive Committee of the American Society of Internal Medicine.

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Roosevelt Hospital

The Medical Service of The Roosevelt Hospital continued to teach Introduction to the Patient, a portion of the Core Clinical Clerkship in Medicine, and to offer various medical electives to P&S students. The Physicians Training Program in alcoholism was the major graduate educational activity of the Smithers Alcoholism Center during 1979. A total of thirty-four physicians completed the Program. The Cardiology Division, in conjunction with the Department of Anesthesiology at Presbyterian Hospital, designed an individual preceptorship program for Resident Anesthesiologists interested in obtaining cardiology skills helpful in their specialty. In addition to its usual complement of P&S students, the Pulmonary Division was also assigned a Anesthesiology resident from Presbyterian Hospital for a two month period. The Hematology Division continued the special lecture series in which various aspects of hematology were discussed by outside speakers. The Gastroenterology Fellowship program was increased to two years, thus allowing the senior fellow to broaden his background in gastroenterology by rotating through the Departments of Pathology and Radiology.

A new rotation of medical residents through a separate Medical Intensive Care Unit was instituted by the Medical Service. The Chest Division played

an active role in organizing systems for respiratory support and the treatment of respiratory failure. A section of Oncology was formally established as part of the Division of Hematology and Oncology. Measurement of Anti-thrombin III levels was added to the regimen of tests performed by the Coagulation Laboratory. During 1979, the Cardiology Division introduced new non-invasive tests, thallium exercise scans and gated-pool studies which allow determination of cardiac ejection fraction and wall motion of both left and right ventricles with only an intravenous injection of isotopes. These studies are done in conjunction with the nuclear medicine staff in Janeway Clinic.

In addition to its adult and pediatric clinics, the Division of Allergy/Clinical Immunology and Infectious Disease established a stinging insect venom clinic to facilitate the use of the recently FDA approved venoms for diagnosis and therapy.

The Smithers Center consolidated its formerly scatter-bed Detoxification Service into a 12 bed geographic unit, which is now located in the main Roosevelt complex.

Drs. Mohan Reddy, Paul Lang and Michael H. Grieco continued studies of lymphocyte subpopulations in ragweed and grass pollen allergy. *In vitro* antigen-specific lymphocyte responses were studied during the 1979 ragweed pollen season to assess the responses of lymphocyte subpopulations to natural antigen exposure. The potential significance of this work is an improved understanding of the mechanisms controlling production of IgE antibodies responsible for atopic diseases.

Dr. David K. Meriny and Dr. Michael H. Grieco are studying the immunologic responses to stinging insect venom in patients undergoing therapy in the Venom Clinic. The response to immunotherapy is being evaluated by measurements of serum allergic and blocking antibodies.

Dr. Richard P. Ames continued his collaboration with Dr. Peter Hill of the American Health Foundation in studies of serum lipid alterations during drug treatment of primary hypertension. He reported that the mild increases noted in serum cholesterol during treatment with hydrochlorothiazide tended to occur primarily in patients with the mildest elevations of systolic blood pressure before therapy, in younger patients, and in those with low pretreatment serum cholesterol. The increases in serum cholesterol in the susceptible patients neutralized the beneficial effect on coronary risk status of lowering systolic blood pressure. Thus, myocardial infarction may not improve maximally in hypertension when diuretics are used as first line therapy. In other presentations Dr. Ames noted that weight loss during treatment with

hydrochlorothiazide tended to minimize the increases in serum cholesterol. The addition of antiadrenergic drugs to on-going diuretic therapy of hypertension caused an increase in fasting serum triglyceride but not total cholesterol. However, high density lipoprotein (HDL) cholesterol decreased with this therapy. Thus, lipid risk factors for coronary disease seem to deteriorate with lowering of blood pressure. Recognition and control of this development may contribute to further improvements in cardiovascular morbidity and mortality.

An active research program in studies of hemostasis and thrombosis was continued by the Hematology Division. Research activities including investigation of the platelet adhesion defect in von Willebrand's disease, subclassification of patients with storage pool deficiency, the role of red cells in platelet-induced thrombosis, the effects of anti-platelet drugs on platelet-vessel wall interaction, the role of platelet Factor V in hemostasis, and the identification of isolated deficiencies of platelet procoagulant activities were conducted by Drs. Harvey J. Weiss, Vincent T. Turitto, William Vicic and Bruce Lages.

The research activities of the Division of Endocrinology were carried out in the laboratories of Dr. William Rosner and Dr. Richard Hochberg. During the past year, Drs. Saeed Khan and Gail Wolf continued to work with Dr. Rosner on the binding and disposition of steroid hormones in blood and their entry into and disposition within target organs. During the past year new methods for the isolation of human testosterone-estradiol-binding globulin were accomplished. Monospecific antisera were obtained and efforts started toward the development of radioimmunoassay. In addition, structural studies on the protein were begun. In the area of cortisol binding, messenger RNA was isolated from rat liver and rat corticosteroid-binding-globulin (CBG) was synthesized in a cell free system. This ability to translate CBG will allow investigation of the control of CBG synthesis.

Dr. Hochberg continued to study the relationship of the biochemistry of estrogens to breast cancer. A recent exciting finding was the discovery of a new chemical class of estrogen derivatives which are biosynthesized by estrogen target organs of the rat and by human breast tumors. This class of compounds which is very nonpolar, was isolated and separated into five distinct compounds. Their structures and biological function are now under investigation. Together with Dr. Rosner, an ^{125}I -estradiol was synthesized and shown to bind with high affinity to the estrogen receptor. This method vastly simplified the assay for estrogen receptors in human breast cancer. The same estradiol compound was

synthesized with the isotope ^{131}I and used to image estrogen target organs with a gamma camera. This agent may be useful for the detection and treatment of estrogen receptor containing breast cancers.

Drs. Anthony J. Pepe, Edward M. Dwyer, Jr. and Bruce Pinkernell completed an investigation into the effectiveness of a new cardio-selective Beta Blocking agent, Pindolol, in patients with angina pectoris.

Dr. Henry Greenberg continued his study in the CCU. Computer-assisted gathering of patient data is being analyzed to help in prediction of patients who develop shock or cardiac rupture later in their hospital course.

Drs. Mark Sherrid, Alan Feit, and Edward Dwyer began an investigation of the chronic effects of Prazosin used as a vasodilator drug in the treatment of congestive heart failure.

Dr. Anthony Pepe, Dr. Luther Clark and Dr. Dwyer recently initiated a study evaluating the efficacy of Nifedipine, a calcium antagonist, as a treatment for angina pectoris.

During the past year, Drs. Henry Greenberg, Oscar Garfein and Edward Dwyer investigated the natural history of patients who have recently suffered a myocardial infarct. This study is under the sponsorship of the NIH and includes several major centers throughout the country, including Presbyterian Hospital and The St. Luke's Division of The St. Luke's-Roosevelt Hospital Center.

Dr. Gerald B. Phillips continued to study patients with diabetes mellitus in an attempt to determine the nature of the endocrine defect and the influence of the hormonal status.

Honors

Dr. Albert Attia was elected Secretary-Treasurer of the New York Gastroenterologic Association.

Dr. Anetta Kimball was elected President of the New York Academy of Gastroenterology, a member of the Eastern Gut Club, and a member of the American Association for the Study of Liver Disease.

Dr. Kenneth Altman was elected a Member of the New York Gastroenterological Association.

Dr. Harvey J. Weiss continued to serve on the Blood Diseases Advisory Committee of the NIH Heart, Lung, and Blood Institute and presented a talk on "Genetic Disorders of Platelets" at the presidential symposium of the American Society of Hematology.

Dr. Richard Hochberg was elected to serve on the Endocrinology Study Section of the National Institutes of Health.

Dr. David Sibulkin was elected a trustee of the New York State Society of Dermatology and to the

Manpower Committee of the American Academy of Dermatology.

Dr. Wilbur Hurlbut was elected to membership of the Stanford Associates, served on the Malpractice Mediation Panel of the New York State Supreme Court, and was the Chairman of the Stanford University Medical School Committee on Trusts and Bequests.

Dr. Lawrence Scharer was course Director of the 8th Annual Trudeau Pulmonary Course given at Lake Placid, New York.

Dr. LeClair Bissell served on the Advisory Council of NIAAA.

Dr. Anne Geller was a member of the Research Grant Review Committee of the NIAAA.

Dr. John Severinghaus served as Treasurer of the Association for Medical Education and Research in Substance Abuse, as a member of the Committee on Prescription Drug Dependence for the New York State Division of Substance Abuse, and as Chairman of the Subcommittee on Medical Education.

St. Luke's Hospital

Cardiology Division

Dr. William A. Tansey directed the Introduction to the Patient course for second year medical students. Dr. Miles J. Schwartz played an active role in the organization of cardiac physiology conferences in conjunction with the New York Heart Association.

During 1979 the Cardiac Care Unit was renovated. The unit now contains seven acute and 13 step-down beds. In collaboration with the Division of Nuclear Medicine, a nuclear cardiology unit was developed within the new CCU. Dr. Michael Baum and Dr. Tansey conducted clinical studies in this unit.

The number of echocardiograms performed by the echocardiography laboratory quadrupled during 1979. Dr. Alan Mogtader and Dr. Joseph Malauf directed operation of this service.

Dr. Robert B. Case continued his studies of the potential role of CO_2 in the autoregulation of coronary blood flow. Utilizing xenon 133 and a gamma camera, members of the Division of Cardiology pursued their studies of blood flow in stenotic vessels and in grafts. The Division also continued to participate in the NIH supported Collaborative Studies in Coronary Artery Bypass Surgery of which Dr. Harvey G. Kemp is the Principal Investigator and Dr. Airlie Cameron is the Project Director.

Gastroenterology

Members of the Division participated in the second, third and fourth year undergraduate teaching

program of the Institute of Human Nutrition.

Dr. Peter Holt continued his studies on intestinal lipoprotein production and examined the intestinal contribution to circulating triglycerides in a rat model in which triglyceride catabolism was blocked by Triton WR 1339. The intestinal contribution to the systemic triglyceride pool was found to be 20% at most, but specific changes in lymph VLDL apoprotein patterns suggested that circulating lipoproteins alter intestinal lipoprotein apoprotein composition. Initial studies on the intestinal absorption of lipids in aged Fisher rats indicated that both mucosal uptake and transmucosal transport of triglyceride and calciferol was impaired in 27 month old animals. Dr. Holt, with Dr. Joshua Feibusch, demonstrated that aged normal volunteers had a significantly reduced capacity for the intestinal absorption of carbohydrates. With Dr. B. Kopelman, he studied four young siblings with prolonged cholestasis leading to cirrhosis and other unique features which suggested a diagnosis of progressive cholangiolitic cirrhosis.

Dr. Donald Kotler developed an experimental model for measuring in vivo lactose absorption.

Dr. Jean Saleh, with Dr. Paul Lebwohl, demonstrated that patients with anorexia nervosa had a significantly delayed gastric emptying rate which consistently improved with metoclopramide therapy.

Hematology

Dr. Thalia Boussios and Dr. John F. Bertles, in a collaboration with Dr. Albert S. Gordon (New York University), found that thyroid hormone (T_3) (known to stimulate erythropoiesis) attaches to the erythroid cells of fetal liver at a specific "receptor" sites associated with the nucleus.

Dr. Beatrice Magdoff-Fairchild, working with Dr. Celia C. Chiu, discovered two crystalline forms of deoxygenated sickle hemoglobin whose structures now afford full understanding of the intermolecular contacts that stabilize the sickle-cell fiber. These fibers are the cause of erythrocyte destruction in sickle-cell anemia.

Dr. Alice Maniatis, working with Dr. Mukul K. Basu and in collaboration with Dr. David Schachter (Physiology), examined the effects of enriching or depleting erythrocyte membranes of cholesterol on the expression of cell surface antigens.

Infectious Diseases

Dr. Judith L. Axelrod continued her studies of antibiotic pharmacology of the human eye.

Metabolism and Nutrition

During 1979, twenty-four medical students from the College of Physicians and Surgeons and other

medical schools joined the Division for elective clinical work.

Special programs for the study and management of lipid transport disorders and for a multidisciplinary approach to the treatment of obesity were emphasized in studies conducted in the Metabolic Unit. The special program for weight reduction initiated last year under the aegis of the Obesity Research Center, resulted in the treatment of over 180 patients.

Metabolism, Nutrition and Endocrinology

Dr. Theodore B. VanItallie together with Dr. Katherine Porikos and their associates continued to study the effect of covert nutritive dilution on spontaneous food intake in nonobese and obese human subjects. Drs. Porikos, Ann Sullivan and VanItallie also developed a new technique for studying the effect of anorectic drugs on spontaneous food intake. By means of this approach, which included the use of an "intensive design," they demonstrated a clear inhibitory effect on food intake of diethylpropion (Tenuate). Dr. Porikos investigated the effects of high fiber intake on satiety and with Dr. Arthur Livingston studied compliance with high fiber diets in outpatients. Dr. VanItallie and Dr. Mei-Uih Yang continued prolonged and detailed metabolic studies of obese inpatients undergoing treatment with very low calorie diets consisting either of protein alone or an equicaloric mixture of protein and carbohydrate. Their findings indicate that protein alone has no advantages over a protein-carbohydrate mixture when such regimens are fed in quantities providing about 500-600 kcal per day. Dr. Richard DiRocco continued studies on brain metabolism in the rat with particular emphasis on the search for insulin sensitive "glucoreceptors." Dr. VanItallie investigated the usefulness of an electromagnetic instrument for the measurement of lean body mass and body fat content of human subjects. Together with Drs. Holt, Pierson and Wang, Dr. VanItallie participated in a study of the intracellular potassium of obese human subjects. Dr. Jose L. Barbosa-Salvidor began a study of the metabolic effects of hyperalimentation using various concentrations of fat emulsions.

Dr. Sami A. Hashim continued to study the effect of medium chain triglyceride (MCT) on cellularity of adipose tissue. In collaboration with Drs. Naji Torbay, Phillipppo Bracco and Alan Geliebter studies revealed that animals fed MCT as 50% of dietary calories had significantly less body fat than animals fed isocaloric quantities of LCT. The same group demonstrated that insulin injections to rats resulted in greater adiposity than in animals receiving an identical diet plus saline injections. Insulin appeared to

promote fat deposition independent of its effect on food intake. Dr. Hashim collaborated with Dr. Steven Ryan in studies involving the isolation, characterization and quantification of the pulmonary surfactant system of the lung.

Dr. F. Xavier Pi-Sunyer, in collaboration with Drs. K. Reemstma, C. Weber and M. A. Hardy of the Department of Surgery continued studies of the efficacy of pancreatic islet transplantation. They showed that organ culture of islets for 6 to 8 days before transplantation was feasible, allowing survival of the endocrine tissue while diminishing the exocrine. In comparative studies of various sites of transplantation, they demonstrated in the rat that transplantation under the renal capsule is the easiest and most economical site. With Ms. Vermitsky, Dr. Pi-Sunyer also showed an intramuscular site to be feasible for transplantation. With Drs. H. Kissileff, J. Thornton and G. P. Smith, Dr. Pi-Sunyer found that cholecystokinin is effective in decreasing the duration of a meal and therefore food intake in normal lean volunteers. In concurrent studies conducted with Ms. R. Woo, no such effect was found with insulin. With Ms. S. Fried, Dr. Pi-Sunyer reported that two inhibitors of fatty acid synthesis in the adipocyte did not affect insulin binding or transport but did inhibit insulin stimulated glucose utilization.

Dr. Robert S. Bernstein studied factors which influence the insulin sensitivity of adipose tissue in overnight culture. With Mr. K. Zimmerman and Ms. A. Carney he determined that the insulin insensitivity induced by high fat, low carbohydrate diets is specifically due to the fat content. With Drs. J. Feibusch, J. Barbose-Saldivar and G. Robertson he described the first case of nephrogenic diabetes insipidus induced by a malignant tumor leiomyosarcoma metastatic to the liver.

Dr. Harry Kissileff, continuing his work with the universal eating monitor to study cumulative food intake curves during single course meals in man showed that the initial rate of eating is augmented following 21 hour food deprivation and that the rate of deceleration during that meal is also increased.

In work with animals Dr. Kissileff also demonstrated that dietary dilution and taste change interact in such a way as to prevent the normal increase in intake to a diluted diet when it is adulterated with a concentration of quinine that fails to effect intake in a concentrated diet.

Dr. Joseph R. Vasselli joined the Obesity Research Center this year with a 3 year NIH grant to investigate the behavioral and metabolic correlates of genetic obesity. He is currently conducting studies on the onset of hypercellular obesity in the genetically obese Zucker rat. Dr. Vasselli and his co-

investigator, Dr. M.R.C. Greenwood are now testing pharmacological and dietary agents which may reduce the undesirable lipid deposition and hunger levels in animals with hypercellular obesity.

Nuclear Medicine

A formal residency training program was approved in September, 1978 by the American Medical Association Committee on Residency Education.

New clinical activities included development of Nuclear Cardiology as a clinical service. This involved a cooperative venture between William A. Tansey, M.D., Assistant Director of the Cardiac Care Unit, and Dr. Richard N. Pierson. Dr. Marvin Friedman also played a major role in this collaboration. Addition of full-scale renal function and imaging measurements was instituted by Dr. Enlander on his arrival in June 1978.

Body Composition studies of extracellular water, total body water, exchangeable sodium, and total body potassium were applied increasingly to patients undergoing weight reduction in connection with the Obesity Center studies under the direction of Dr. Theodore B. Vanltallie and his associates.

The Division of Nuclear Medicine continued studies of quantitative radiocardiography. A new method of evaluating right ventricular function and right ventricular volumes was performed by Dr. Por-Jau Huang.

Pulmonary Diseases

The Pulmonary Division developed new rotations for PGY-1 and PGY-2 house officers, residents in Radiology at St. Luke's-Roosevelt Hospital Center, and Anesthesiology residents at Presbyterian Hospital. The Pulmonary Division also organized a new training program in basic cardiopulmonary resuscitation for medical staff and house staff, and an advanced cardiopulmonary resuscitation program for house officers in critical care areas.

Dr. Saul Kaplan developed a new technique of thoracoscopy utilizing a fiberoptic laparoscope.

Research studies of acute lung injury in an animal model which stimulates acute respiratory distress syndrome (ARDS) in man have been extended by Dr. Stephen F. Ryan (in Dept. of Pathology), Dr. C. Redington Barrett, Jr., Dr. Deng Fong Liao, and Dr. A. Loomis Bell, Jr. Lung lipid analysis, correlated with mechanics and histology, added further evidence that acute stage respiratory distress is due to alveolar closure from loss of surfactant activity.

Renal Division

The Hemodialysis Unit continued to provide ser-

vices to ever increasing numbers of patients. While the Unit operated at approximately 85% of capacity in 1978, it functioned at close to 100% during the past year. The home training unit continued to provide teaching to those end stage patients who prefer hemodialysis at home. The staff of the home unit is presently developing a program to teach home peritoneal dialysis and chronic ambulatory peritoneal dialysis. The responsibility for patients markedly increased because the Nephrology Division provided tertiary care for the dialysis patients from the Flower Fifth Avenue Dialysis Unit. In addition primary responsibility for follow-up care of transplant recipients was provided by the Nephrology Division in the newly opened renal clinic. The consult service was also expanded to include patients admitted to the Roosevelt facility of St. Luke's-Roosevelt Hospital Center.

The renal laboratory expanded to include a cooperative effort with Columbia Department of Bio-engineering. Fred Daniels, a Ph.D. candidate under the direction of Dr. Edward Leonard, is presently establishing a sophisticated computer based system to analyze variation in pressure and flow characteristics of the rat kidney. Dr. Jeffrey Brensilver is developing a model to study the effects of peritoneal dialysis in the anephric and ureteral obstructed rat. Dr. Jonathan Lorch has begun a study analyzing hyperprolactinemia as a potential cause of impotence in male dialysis patients.

Honors

Dr. Harvey G. Kemp, Jr. continued as consultant to the National Institutes of Health Hyperlipidemia Type II Study and also as Governor for Metropolitan New York, American College of Cardiology and on the Board of Trustees of the New York Cardiological Society. Dr. Kemp was also a Charter Fellow and Member of the Board of Trustees, Society of Cardiac Angiography.

Dr. Airlie Cameron served as Consultant to the National Institutes of Health Hyperlipidemia Type II Study.

Dr. Samir E. Alam and Dr. Allen H. Mogtader were elected Fellows in the American College of Cardiology.

Dr. Peter R. Holt was elected to membership on the Intersociety Committee on Clinical Experimentation in Digestive Disease, the Scientific Advisory Committee of the National Foundation for Ileitis and Colitis, the Work Group on Clinical Research of the National Commission of Digestive Disease and the Governor's Council, New York State, American College of Physicians.

Dr. Richard S. McCray was elected Chairman of

the Council of Regional Endoscopic Societies and to the Governing Board of the American Society for Gastrointestinal Endoscopy. Dr. McCray was also Course Director, Gastrointestinal Endoscopy Techniques and Clinical Applications, New York Society for Gastrointestinal Endoscopy.

Dr. Jean Saleh participated in the Postgraduate Course of the New York Society of Gastrointestinal Endoscopy.

Dr. Bertles continued to serve on the (ad hoc) Hematology Study Section of the National Institutes of Health and on the Basic Science Advisory Committee of the National Foundation.

Dr. Van Itallie began his duties as Editor-in-Chief of the American Journal of Clinical Nutrition. He also continued work as a member of the National Arthritis, Metabolism and Digestive Diseases Advisory Council. He served as a member of the Task Force on Dietary Factors in Relation to the Nation's Health and edited the supplement to the American Journal of Clinical Nutrition in which the proceedings of the symposium presented by the Task Force were published. Dr. Van Itallie also continued to serve as Chairman of the Committee on Medical Sciences of the Board of Trustees of the American University of Beirut.

Dr. F. Xavier Pi-Sunyer, who was the recipient of a Senior International Fellowship of the Fogarty Center (NIH), was on sabbatical leave as a Visiting Scientist at the Clinical Research Center, Northwick Park Hospital, London.

Dr. Robert Bernstein was elected Vice-President of the Clinical Society of the New York Diabetes Association. He was also elected Chairman of the Membership Committee of the New York County Medical Society and President of the Food and Nutrition Council of Greater New York.

Dr. Harry Kissileff has been elected to membership in the American Physiological Society.

Dr. Jose L. Barbosa-Saldivar has been elected Associate member of the American Society for Clinical Nutrition.

Dr. Joseph Vasselli has been appointed coordinator of the Columbia University Seminar on Appetitive Behavior.

Dr. Katherine Porikos has been invited to join the Department of Nutrition of Queen Elizabeth College in London for nine months.

Dr. Richard Pierson was elected Chairman of the Board of the New York County Health Services Review Organization in May 1979. He also lectured for the fourth consecutive year in the Milwaukee Nuclear Cardiology Symposium and was Visiting Professor at Duke University.

Dr. A. L. Loomis Bell, Jr., Dr. C. Redington

Barrett, Jr. and Dr. Stephen F. Ryan participated in the Annual Course of Pulmonary Physiology, N.Y. Trudeau Society.

Acknowledgements

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Microbiology

HAROLD S. GINSBERG
Professor and Chairman

The Department has continued to strengthen its development as a center for education and research in immunology, virology, and regulation of prokaryotic and eukaryotic cells. The Department of Microbiology is an integral unit of the Cancer Center.

Teaching

Two major courses were presented to medical, dental, and graduate students: 1) Microbiology of Bacterial and Mammalian Cells for first year students; and 2) Biology of Pathogenic Organisms, which includes bacteria, viruses, and fungi, is given to the second year class. For entering graduate students the courses described above are supplemented with a special course in research methods and analysis of experimental data; thereafter graduate students have available graduate courses in Bacterial and Molecular Genetics, Immunochemistry and Cellular Immunology, Prokaryotic and Eukaryotic Cell Physiology, and Virology. The curriculum of the first two years of medical school has been restructured, and the Department once more has the opportunity to integrate the teaching of Microbiology for medical and dental students into a single course. The new course was presented for the first time in the 1979 Spring semester.

Six new graduate students were accepted into the Department in the Fall of 1979 making a total of 24 enrolled in the Graduate School of Arts and Sciences as candidates for the Ph.D. degree in Microbiology. In addition, one student is registered in another Uni-

versity, but is pursuing her thesis research in virology in this Department.

Four postdoctoral fellows are in training. Seven Ph.D. degrees in Microbiology, were awarded in 1978-79 each has obtained an outstanding postdoctoral position. Cecilia Cheng, Sloan Kettering Cancer Institute; N. Yutaka, National Institutes of Health; Mercio Pereira, New York University School of Medicine; Michael Wigler, Cold Spring Harbor Laboratory; Gloria Lee, University of Chicago Virology Committee; Zvi Kahana, Weizmann Institute of Science, Department of Plant Genetics; Raymond Monk, Institute for Cancer Research, Fox Chase, Penn.

The graduate program is being supported by a training grant awarded by the National Institute of Allergy and Infectious Diseases.

Under the supervision of Dr. Paul D. Ellner, Dr. Stephen Antopol completed one year of training in the Postdoctoral Training Program in Clinical Microbiology. He is now Pathologist and Director, Clinical Microbiology, Bellevue Hospital.

Dr. Alberto Correa-Londono was accepted for two years into the Postdoctoral Training Program in Clinical Microbiology as of September, 1979.

Dr. Bernard F. Erlanger was on sabbatical leave at the Institut Pasteur in Paris for 6 months as a Scholar of the American Cancer Society, in the laboratory of Dr. S. Avrameas. He carried out research on the presence of DNA receptors on cell membranes. The collaboration is continuing. Jan Wollack (M.D.-

Ph.D. student) has completed studies on antibodies to the oligonucleotides sequences AA(U)_n (n=1-4), during which he developed improved procedures for the synthesis of oligonucleotides. His results provide information about the antibody binding site and the conformations of the nucleotides, and also provide crucial information needed to develop immunological probes of more complex sequences in nucleic acids. Roy D. Meredith, a graduate student, has continued his work with highly specific antibodies to 7-methylguanosine-5'-PO₄. He is using them to study properties of messenger RNA, its regulation and the conformation of the 7-methylguanosine cap at the 5' end of m-RNA. Harriet Castleman is continuing immunoelectron microscopic studies on the structure of ASV RNA using anti-7-methylguanosine as well as antibodies specific for adenosine, cytidine and polyadenylic acid. She is also using similar techniques to study the structure of single stranded viral DNA. In collaboration with Dr. O.J. Miller (Human Genetics) anti-purine and pyrimidine antibodies are being used to study the structure of mouse and human metaphase, as well as *Sciara* polytene chromosomes. With Dr. Miller and Dr. R. Guntaka, the relationship of methylation to regulation of gene transcription is being studied using anti-5-methylcytosine.

Research

Dr. Ginsberg and his colleagues, Dr. Karoline Dorsch-Häsler, Dr. Judyta Praszkiar, Dr. Paul B. Fisher, Dr. I. Bernard Weinstein, Dr. Jane Hsiao, Ms. Elizabeth A. Oosterom-Dragon, Mr. Ted E. Shutzbank, Mr. Lee Babiss, and Ms. Ulla Lundholm, are investigating the reactions regulating adenovirus replication and cell transformation. Genetic, biochemical, and immunological approaches are used to probe these problems which are central to understanding viral infections. Drs. Ginsberg and Dorsch-Häsler in collaboration with Drs. Fisher and Weinstein (Institute for Cancer Research) have continued studies of the integration of adenovirus DNA into the chromosomes of transformed cells and the failure of chemical carcinogens and the phorbol ester tumor promoters to affect viral DNA integration although these chemicals do increase transformation. Intensive studies are being pursued on a selected rat fibroblast cell line (derived from Fisher rat cells) which type 5 adenovirus transforms at a frequency at least 100 times greater than the parent Fisher rat cells or primary rat embryo cells. With Dr. Praszkiar more than 50 temperature-sensitive (*ts*) mutants of type 7 adenovirus have been isolated in order to obtain mutants in genes not previously detected with type 5 adenovirus. These mutants have been classified into

10 complementation groups. In studies with Drs. Praszkiar and Hsiao major emphasis is being placed upon a series of "late" mutants that synthesize normal amounts of the major capsid proteins but no infectious virus, at the non-permissive temperature, since these represent previously undetected mutations and may prove to be valuable viruses for inclusion in a vaccine. With Ms. Dragon studies on the function of the non-structural "100K" protein have been made using selected *ts* mutants precisely mapped by marker rescue and intertypic recombination analyses. These studies clearly show that functional 100K protein is essential for synthesis of intact, trimeric hexons. The 100K protein appears to associate with nascent hexon polypeptide chains and either chemically modifies them or serves as a "scaffolding" type protein for hexon assembly. Mr. Shutzbank and Dr. Ginsberg have further characterized the transcripts in adenovirus-transformed cells containing the entire viral genome. All regions, early and late, are transcribed, but only the early transcripts are processed into mRNAs. Superinfection of the transformed cells does not induce processing of late transcripts, indeed the superinfected transformed cells, although permissive for viral DNA replication, are totally non-permissive for production of infectious virus. The super-transforming FRE cells isolated by Dr. Fisher are not only non-permissive for virion production but also non-permissive for replication of viral DNA. Dr. Ginsberg, Ms. Lundholm, and Mr. Babiss are developing techniques for isolation of *ts* mutants in any gene desired. This is of considerable importance since many genes, particularly those concerned with early replication events, have not been affected by classical mutagenesis techniques. Dr. Ginsberg in collaboration with Dr. Joseph Nevins and Dr. James Darnell, while on sabbatical leave at the Rockefeller University, studied the kinetics of transcription of early regions of the viral genome and demonstrated that they are coordinately regulated. With Mr. Jeffrey Weber, Dr. Jean-Marie Blanchard, and Dr. James Darnell (Rockefeller University) *in vitro* processing of the early transcript for the DNA-binding ("72K") protein was demonstrated.

Dr. Paul Ellner and his collaborators' activities involved the rapid detection of hemolytic streptococci in throat and vaginal cultures; the development of an improved transport medium; and the development of latex tests for streptococci, *Haemophilus influenzae*, and *Neisseria gonorrhoeae*.

Dr. W.L. Cleveland, with Irene Wood, has refined the procedure for detection of macromolecule-secreting cells to include cells that secrete suppressor(s). His procedure, using multiple markers, allows the identification of more than one secretory

product of a single cell, of more than one property of a secretory product, as well as characteristics of the cell membrane. Some aspects of this program are being done with Dr. R. Gershon of Yale. Studies on the elicitation of anti-idiotypic antibodies are being carried out with Dr. Sherie Morrison.

Lin-hsiang Wei and Chia-ling Huang, from the Institute of Cell Biology, Shanghai, China, are continuing their training in immunochemical and immunocytological techniques. Mr. Huang has been producing hybridomas that secrete antibodies to 5-methylcytosine.

Norbert H. Wassermann is continuing his studies on photochromic reagents specific for the acetylcholine receptor. A fluorescent cholinergic marker has been designed for collaborative work with Dr. G. Hess of Cornell University. With Dr. H. Lester of California Institute of Technology, experiments with a photochromic inhibitor has provided evidence for a mechanism of action of local anaesthetics.

The immunochemical laboratories of Dr. Elvin A. Kabat continues research on the structural and genetic basis of antibody complementarity, mapping of the combining sites of antibodies and lectins, preparation of monoclonal antibodies to dextrans and to concanavalin A by the hybridoma technic, measurements of binding constants of homogeneous antibodies by affinity electrophoresis, elucidation of the structure and specificity of the water soluble blood group A, B, H. Le^a and Le^b, I and i glycoproteins, and on the antigenic properties of oligosaccharides coupled to fatty acid amines.

The second edition of the book *Variable Regions of Immunoglobulin Chains*, by E.A. Kabat, Tai Te Wu of Northwestern University and Howard Bilofsky of Bolt, Beranek, and Newman has been expanded to include precursors, constant regions, J chain and B₂-microglobulin and retitled *Sequences of Immunoglobulin Chains* has appeared as NIH Publication 80-2008. The data base of sequences is maintained in the NIH PROPHET computer system by Bolt, Beranek, and Newman. The number of amino acid residues sequenced in the variable region alone increased 50 per cent since the 1976 edition.

The information has provided evidence of Mendelian independent assortment of the framework and complementarity determining regions which make up the variable region and Drs. Kabat, Wu, and Bilofsky have put forward the hypothesis that antibody diversity is generated somatically during differentiation by the assembly of nucleotides coding for these segments into complete V-region genes; the nucleotide segments being called minigenes. At least one DNA segment, the J segment coding for amino acids 96-107, has clearly been shown to be a mini-

gene and the assortment principle has been adopted by other groups of workers.

Evidence is accumulating the minigene hypothesis to other framework and complementarity determining segments. Drs. Wu, Kabat, and Bilofsky have tabulated the nucleotide sequences of the three V_L clones and five V_K clones thus far recorded and have selected stretches of six or more nucleotides which are identical in all eight clones allowing one mismatch. Seven such matches were found, two matching at 6/7, two at 7/8, two at 8/9, and one at 9/10 nucleotides in all eight clones.

The locations of four of these segments occur at the junctions of the framework and the complementarity determining segments, the fifth occurs in the intervening sequence just beyond residue 95, the point at which DNA of the J segment is joined to the DNA coding for the rest of the V-region. This finding is consistent with the minigene concept. An additional significant finding is that an identical amino acid segment comprising amino acids 35 through 49 is present in 1 human, 20 mice and 13 rabbits; this segment has thus been preserved for 80 million years. Its preservation over this long period of evolutionary time is difficult to explain if it existed in the genome of many copies but if it were a minigene present in the genome in but a single copy, with the alternative sequences having arisen by gene duplication and mutation, its preservation would be quite understandable.

Jacqueline Sharon, a graduate student, Drs. Sherie L. Morrison and Kabat have developed a very useful technic termed replica immunoadsorption, capable of identifying one antibody producing clone of the desired specificity in the presence of 10,000 clones not producing this antibody. Ms. Sharon is studying the repertoire of anti α 1 \rightarrow 6 dextran combining sites by isolating and characterizing hybridomas.

Dr. Shunji Sugii, a Staff Associate, and Dr. Kabat have been determining the sizes and shapes of the combining sites of NZB anti-dextran myelomas and of anti-levan myelomas. Dr. Sugii has also purified and characterized the combining site on the hemagglutinin of *Wistaria floribunda*.

Drs. Sugii and Kabat in collaboration with Dr. Michael Potter and Ms. Marjorie Shapiro at NIH have been characterizing a mouse myeloma which has an unusual anti-dextran specificity and have found it to be most specific thus far for panose, an oligosaccharide whose structure is isomaltosyl α 1 \rightarrow 4Dglucose.

Dr. Albert M. Wu, Senior Staff Associate, and Dr. Flavio Gruezo have been fractionating blood group oligosaccharides by high pressure liquid chromatography and have developed methods for separat-

ing isomeric oligosaccharides with six or more sugar constituents. These oligosaccharides represent internal structures in blood group A, B, H, Le^a, Le^b and I precursor substances.

Dr. Kabat, Mr. Liao in collaboration with Professor R. U. Lemieux of the University of Alberta have mapped the anti-I Ma (group I) site as complementary to $\text{dGal}\beta\text{l}\rightarrow\text{dGlcNAc}\beta\text{l}\rightarrow\text{6CH}_2$ - and in collaboration with Dr. H. Schenkel-Brunner of the University of Vienna have been able to synthesize the determinant enzymatically by addition to a precursor glycoprotein. Drs. Wu, Kabat, and Gruezo have also studied the combining sites of *Bauhinia purpurea* lectin in collaboration with Dr. Howard J. Allen of the Roswell Park Memorial Institute and of the *Sophora japonica* lectin with Dr. Ronald D. Poretz of Rutgers University.

Mr. Charles Wood (graduate student) and Dr. Kabat have been studying the antigenicity of micelles and liposomes formed by coupling stearylamine to the isomaltose oligosaccharides. These materials when incorporated into complete Freund adjuvants are antigenic in rabbits both on liposomes and merely when emulsified in the adjuvants in which they may also form micelles or liposomes. The antibodies formed, although heterogeneous are of more restricted specificity than those produced to dextran.

Mr. Wood and Dr. Kabat together with Drs. Lee A. Murphy and Irwin J. Goldstein of the University of Michigan have characterized the combining sites of the specific isolectins of *Bandeiraea simplicifolia* A₄ and B₄.

Dr. Kabat and Mr. Jerry Liao are collaborating with Drs. Edward Franklin and David Geltner of New York University College of Medicine and Dr. Marian Koshland of the University of California at Berkeley have been studying the combining sites of an IgM myeloma protein which reacts with agar. Drs. Kabat, Osserman, and Mr. Liao have also been studying several other myeloma proteins which react with agar. All have combining sites of different specificities which are being characterized.

Dr. Paul Kaladas has begun working on preparing hybridomas making antibody to determinants of Concanavalin A and will attempt to characterize their combining sites. He is also studying trifluoroacetylolysis of blood group substances and is working on the lectins of *Vicia villosa*.

The work carried on by Dr. Stephanie Phillips and by Mrs. Lanping Amy Sung (graduate student with Dr. Kabat) will appear in the report of the Department of Human Genetics and Development.

Dr. Kabat is serving as consultant to the National Cancer Institute. He received the R. E. Dyer Lecture Award from the National Institutes of Health, and

delivered the Third Alexander S. Wiener Lecture. He attended the Symposium in honor of Jacques Oudin at the Institut Pasteur, participated in the Teaching Symposia organized by the International Union of Immunological Societies in Sesimbra, Portugal in May and at the International Laboratory for Research in Animal Diseases at Nairobi, Kenya in October.

In 1979, Dr. Benvenuto Pernis' laboratory of Cellular Immunology in the Department of Microbiology have been engaged in the following research projects:

1. The expression of IgD on the membrane of mouse lymphocytes. This work has been performed mainly by Paolo Tonda and Lotte Kuhn. With the use of two different monoclonal antibodies against the two alleles of mouse IgD, it has been possible to show, by fluorescence microscopy, that there is complete allelic exclusion of IgD alleles in the mouse. It was also possible to show that the ratio between cells expressing one or another allele varies in different F1 hybrids, and that there is considerable number of IgD⁺ cells in the bone marrow. The allelic ratio in the bone marrow is the same as in peripheral lymphoid tissues.

2. Turnover of membrane IgM and IgD in human lymphoblastoid lines. This work has been performed mainly by Phil Roth. Biosynthetic labelling of membrane immunoglobulins with ³⁵S-methionine has shown that the turnover of membrane IgM and IgD is the same for both classes with a half-life shorter than eight hours. This finding emphasizes the significance of the different effects of anti-IgM and anti-IgD antibodies of which the first results in the stimulation of production of target immunoglobulins whereas the second induces its blockade.

3. Expression of the idiotype of anti-dextran alpha 1→3 binding immunoglobulins in mice. This project has been mainly conducted by Carol Victor, Paolo Tonda and Lotte Kuhn. With the use of purified antibodies against the common idiotype of the monoclonal J558 and MPC104 proteins of the BALB/C mice, it has been possible to show that very large numbers of plasma cells containing these idiotypes appear in the spleen of BALB/c mice five days after immunization of the dextran containing alpha 1—3 linkages. These cells are absent in the idiotype negative A/HeJ strain of mice after immunization but can be detected in lipopolysaccharide stimulated cultures of the same strain of mice. These findings imply that regulatory processes rather than the presence or absence of structural V_H genes are important for the expression of this idiotype in different strains of mice.

Expression of the idiotype of monoclonal IgM

with anti-gamma globulin activity by lymphoid cells of normal persons and of patients with rheumatoid arthritis. This work was mainly performed by Dr. Vincent Bonagura in cooperation with Dr. Henry G. Kunkel of Rockefeller University. Approximately 60% of monoclonal IgM proteins (Wa. group) with anti- γ globulin activity are closely related and show cross-reacting idiotypes (C.R.I.) The overall frequency of monoclonal IgM proteins with anti- γ globulin activity is between 5-10% of all macroglobulin-aemias; it appeared therefore probable that B cells expressing the C.R.I. might be fairly frequent in normal individuals and even more frequent in subjects with rheumatoid arthritis. We have prepared purified antibodies against the C.R.I. by immunizing rabbits with one monoclonal protein of the Wa. groups (Ea.); the cross-reacting antibodies, after absorption with insolubilized unrelated IgM proteins and human IgG, were recovered by affinity chromatography on a column of IgM protein from another member of the group (Wa.).

After further absorption with 12% normal human serum, these antibodies were used to stain in indirect immunofluorescence the cytoplasm of plasma cells induced by pokeweed mitogen after 5 days of culture of peripheral blood lymphocytes from normal subjects and from patients with active rheumatoid arthritis. A second staining with polyvalent anti-human immunoglobulin antibodies (conjugated with a different fluorochrome) allowed the enumeration of all immunoglobulin-containing cells of the same cultures. The cultures from normal subjects showed that 1-3% of all Ig-containing cells had the C.R.I., whereas in patients with rheumatoid arthritis, the figures were 11-21%. Selective suppression (of the appearance of plasma cells with C.R.I. was obtained by adding to the cultures 10 μ g/ml of anti-C.R.I. antibodies, whereas no such effect was obtained with normal rabbit γ -globulins. In conclusion, it appears that B cells marked by the C.R.I. are present in small numbers in normal individuals and that they become much more numerous in patients with rheumatoid arthritis.

5. Role of HLA in antibody production by human peripheral blood lymphocytes *in vitro*. This work was performed by Dr. Vincent Bonagura in cooperation with Dr. Andrei Augustin, a new faculty member who has brought to us a technique to prime T lymphocytes *in vitro* with antigens that has proven to be quite effective for the priming of human peripheral blood T lymphocytes. These primed cells have been shown to cooperate for antibody production with the B lymphocytes of the same individual or of other individuals that share at least one haplotype at the HLA-D locus with the donor of T lymphocytes.

This finding formally proves that the human HLA-D locus is analogous to the I region of the mouse.

In collaboration with Dr. Benvenuto Pernis, and some members of Dr. Pernis' group, in the laboratory of Cellular Immunology, Dr. Augustin is pursuing the following directions of investigation: 1) The expression of idiotype-like determinants on antigen specific, MHC-restricted helper cells; 2) The T cell induced polyclonal activation of B cells and the involvement of T cells in the induction of immunoglobulin switch; 3) Functional studies on the thymus epithelial cells in long term culture aimed at understanding their role in the generation of diversity of T cell receptors (in collaboration with Margaret Widman).

Dr. W. Manski's immunochemical cross-reactions between calf lens alpha crystallin and homologous proteins from different vertebrate classes were used for the study of antigenic determinants which, in the evolution of this protein, were derived from common ancestral forms. Determination of the sequence in which the different antigenic determinants evolved was based on estimation of the relative number of antigenic determinants shared by calf alpha crystallin with alpha crystallin from other vertebrate classes. The immunochemical determination showed that the phylogenetic sequence in which antigen determinants present in the calf alpha crystallin molecule were formed, progressed from the primitive aquatic vertebrates agnatha, elasmobranchii and actinopterygii to the primitive land vertebrates and then to amphibians, reptilia, aves and mammalia. For the estimation of the relative amount (%) of determinants derived from different ancestral forms and transferred in evolution to calf alpha crystallin, 125 I bound to a calf alpha crystallin immunoadsorbent after saturation with total 125 I anti-calf alpha crystallin Fab fragments was compared to 125 I bound to the same amounts of calf alpha crystallin after saturation with 125 I Fab fragments of phylogenetically restricted specificity. Of all antigenic determinants in present-day calf alpha crystallin, approximately 42% were found also in the homologous lamprey protein. These determinants originated with the primitive agnatha which started the vertebrate subphylum 450 million years ago. Only about 15% originated with the mammalia, some 200 million years later, reflecting the slow evolutionary change of this protein molecule.

Clinical and histological studies indicate that the synergistic effect of histamine with PGs of the E-type in the conjunctiva produces an inflammatory response similar to that seen in various clinical forms of human allergic conjunctivitis. Such a response could not be produced by histamine or PGE₁ or

PGE₂ alone even at much higher doses than in the mixture. The data indicate that an interplay of several different mediators may be crucial in the conjunctival response in allergy.

In simultaneous experiments, the ability of inbred Wistar-Furth rat corneal cells to stimulate inbred Fisher rat lymphocytes in mixed culture was compared with the stimulatory capacity of the same number of Wistar-Furth skin, kidney, heart and lymphocyte cells. The tissue cells were dissociated and after inhibition by mitomycin C cultured with an equal number of allogeneic spleen lymphocytes for 5 days. In all of these mixed cell cultures, the allogeneic lymphocytic response was mainly to the major Ag-B² histocompatibility antigen. The stimulatory effect of corneal cells was found to be the same as that of heart, kidney and skin cells. The data indicate a lack of differences between the density of histocompatibility antigens on the surfaces of these cells.

A dependence of second-set corneal graft reactions on the size of the sensitizing skin allografts was established in different rat donor-recipient pairs, each of which involved a response to the B² major histocompatibility antigen. Sensitizing skin sizes larger or smaller than the optimal size were found to result in less intense reaction in subsequently placed second-set corneal allografts. The data obtained support the view that a persisting skin allograft not only sensitizes, but constitutes a competitive inflammatory site. The latter role of a first-set skin allograft may be facilitated by being both more accessible to inflammatory cells and larger than corneal grafts. The relative strength of the sensitizing and competitive effects of a first-set skin allograft apparently influences the fate of a second-set corneal allograft.

Second-set corneal graft responses to the major B² histocompatibility antigen were induced in groups of Fisher and Delafield rats sensitized by primary allogeneic skin implants or by primary eccentric corneal grafts. These responses were used as controls for groups of similarly sensitized animals in which competitive inflammatory sites were formed 1 day or 1 week after corneal grafting by additional allogeneic or xenogeneic skin implants. The effectiveness of such additional skin implants at least thirty times the size of corneal grafts in depressing second-set corneal graft reactions was measured by the increase in the relative number of grafted corneas which remained clear as well as the decrease in the relative number of corneas with severe reactions. Both allo- and xenogeneic skin implants were found to decrease the frequency and severity of second-set corneal reactions. This decrease may be related to a stronger attraction of committed and noncommitted lymphocytes to the larger and more accessible skin implants than to cor-

neal grafts. The lack of a statistically significant difference between the effectiveness of allogeneic and xenogeneic skin implants in depressing corneal graft reaction indicates that committed lymphocytes play a relatively minor role in the development of corneal graft reaction initiated by them.

Dr. Dean L. Engelhardt's laboratory over the past academic year have continued work in regulatory mechanisms operating in cultured animal cells. Early in the year with Dr. G. T-Y. Lee a study was completed of the control of protein synthesis that occurs when cells grow into the stationary phase of the growth curve. One of the conclusions of this study was the elucidation of a major translational control mechanism whereby mRNA is differentially recruited from the ribonucleoprotein fraction into the poly-some fraction at a rate characteristic for each specific mRNA species. They also enumerated two types of general regulation (operating during metabolic shifts) that involve regulation of elongation factor I in one instance and the total protein synthetic apparatus in the other.

A major program was initiated studying senescence of cultured human fibroblasts (HF) as a model system for aging. Two proofs have been completed in this regard. First, with Mr. Jeffrey Moley they have shown using complement mediated lysis and Staph A protein binding that senescent cells have no new surface proteins which are immunogenic. Thus there is no easily assayed age-specific surface markers. Second, Dr. Engelhardt, Dr. Lee and Mr. Moley have shown that as cells become senescent there is a concomitant increase in the production of a small number of major cellular proteins. It is reasoned that the HF cells are acting in this case as if they were undergoing terminal differentiation since they begin to produce a limited number of major abundance proteins at the same time that they lose the capacity to divide.

The laboratory has had two outside collaborations. One with Dr. Saul Silverstein wherein it was demonstrated that during Herpes Virus I infection (permissive) there is an increase in nonfunctioning poly-somes—which could be due to the entrapment of host mRNA in inactive polysome structures. A second with Drs. Robert G. Pergolizzi and Dezider Grunberger in which it was reported that lysine contributes atoms to the hypermodified Y base of phenylalanine tRNA.

Finally Dr. Jeffrey Laskin, Dr. I. Bernard Weinstein, Ms. Linda Piccinini, Mr. Leslie Lobel, Dr. Elizabeth Matthew, Dr. Earl Zimmerman and Dr. Engelhardt have been developing the mouse melanoma cell line, B16/C3, into a model system for differentiation. They have shown that melanocyte stimu-

lating factor (5×10^{-10} M) acts as a specific inducer as well as cCMP. They have also shown that these cells have high affinity receptors ($K_d \cdot 10^{-8}$ M) for the benzodiazapine compounds; and have further shown that at melanogenesis specific high abundance proteins are produced. Finally the studies have confirmed the previous suggestion that at melanogenesis an inhibitor disappears from the melanoma cells leading to the appearance of tyrosinase activity. These observations are a part of the general study of the molecular events of melanogenesis.

Dr. Hamish Young is investigating the mechanism of recombination in human adenoviruses. These viruses have a number of technical advantages for studying recombination, including a well-characterized and manipulable genetic system and genome and the ability to grow in a wide variety of human cells in culture. The aim is to determine the mechanisms underlying the initiation of genetic exchange and the resolution of intermediate structures to produce recombinant progeny, using both biological and molecular techniques. In particular we wish to examine whether or not recombination is intimately linked with the mechanism of asynchronous semi-conservative DNA replication peculiar to adenovirus, and the possible role of mis-match repair of transient regions of heteroduplex DNA.

Previously, we have shown that recombination increases during the exponential phase of viral replication. This is consistent with the idea that individual genomes can undergo more than one round of recombination before being assembled into mature virus. In collaboration with Dr. Saul Silverstein, it has been shown by blotting-hybridization techniques, that the intra-cellular concentration of recombinant DNA molecules, relative to parental molecules, increases during the exponential phase of viral DNA replication. We have obtained recent evidence that suggests that even in the absence of gross DNA synthesis recombinant DNA molecules can form. These experiments were performed using temperature-sensitive mutants defective in DNA initiation and, possibly, elongation at the non-permissive temperature. We intend to examine the nature of this recombination further.

Mr. Fredric Volkert (graduate student in Dr. Young's laboratory) is examining the role of mis-match repair in recombination by developing a DNA-transfection system for artificially-produced heteroduplexes. He has shown that when cells are treated with a mixture of DNA's of two distinguishable genotypes, the plaques that arise are genetically pure. This is an important control when analysing the progeny from transfection with heteroduplexes, since each plaque can be considered to have arisen

from a single DNA molecule. Mr. Volkert is constructing isogenic virus strains with distinguishable restriction endonuclease cleavage sites to examine the length of mis-match repair tracts in such heteroduplexes. Recent data from conventional genetic crosses, suggests that recombination may be polar, exhibiting higher rates of exchange at the ends of the genome, consistent with the idea that initiation occurs terminally. The strains constructed by Mr. Volkert will allow a definitive test of this hypothesis.

As in previous years, the research in the laboratory of Dr. Sherie Morrison continues to be directed towards achieving a greater understanding of the genetics and biochemistry of immunoglobulin formation. Using continuous cell lines producing immunoglobulin, Dr. Morrison has been isolating and characterizing cells mutant in their production of Ig.

A major effort has been the isolation of the Ig mutants altered in their ability to bind antigen. J558, a myeloma producing an IgA, λ Ig with specificity for $\alpha 1 \rightarrow 3$ linked dextran was used. Several mutants binding antigen less well than the parent have been isolated by Linda Matsuuchi, a graduate student in Dr. Morrison's laboratory and one of these has been characterized in detail. Peptide map analysis of Fd, Fc, and L chain of the mutant showed no differences from the parent. The mutant Ig reacts with monoclonal anti Idl antisera. However, it has been found that the carbohydrates in the Fd of the mutant heavy chain were larger than the carbohydrates in the Fd of the wild type; this increase in carbohydrate size was found to be due to the presence of sialic acid in the carbohydrate of the mutant which is absent from the carbohydrate of the wild type chain. Examination of the glycoprotein of vesicular stomatitis virus grown in the mutant and wild type cells indicates that the mutant contains an additional glycosyl-transferase. It is generally accepted that the amino acid sequence of the variable region is important in determining antigen-antibody interactions. Evidence is that at least in some antibodies carbohydrate differences may also play a role in determining antigen-antibody interactions.

The levan binding IgA, k myeloma, W3082, has been adapted to continuous growth in tissue culture. A heavy chain deletion mutant has been isolated from W3082; this deletion is in the Fc. The cell makes H and L chains, and, unlike normal Balb/c IgA, forms a covalent H-L disulfide bond resulting in HL half molecules. These half molecules do not bind antigen.

Work has continued on the characterization of the heavy chain deletion mutants derived from the γ_{2b} , k myeloma, 45.6. In collaborative studies with Dr. C. Milcarek, three deletion mutants 10-1, 117, and

G251, synthesizing heavy chains of 47,000, 35,000, and 40,000 daltons molecular weight have been studied. The deleted H chains potentially could result from intracellular degradation of larger chains, from deletions of DNA, altered transcription, altered processing of transcripts, or aberrant translation of mRNA. To directly address the question of the nature of the information in the genome of cells synthesizing wild type and mutant Ig, Dr. Morrison's laboratory elected to isolate the cloned genomic gene and characterize it. The laboratory obtained the cloning vector Charon 4A and prepared phage DNA arms for cloning. A partial EcoRI library of the wild type, 45.6, was generated, screened by the Benton-David method using the γ_{2b} plasmid and positive clones recovered and characterized. The cloning of the genomic DNA of the deletion mutants is in progress.

Available in Dr. Morrison's laboratory is the necessary technology for producing myeloma-spleen cell hybridomas. Jacqueline Sharon, a graduate student in Dr. E. A. Kabat's and Dr. Morrison's laboratory, has developed a technique which permits the rapid screening of large numbers of hybridoma clones in soft agarose. Using this technique she has identified and isolated hybridomas with specificity for either $\alpha 1 \rightarrow 3$ or $\alpha 1 \rightarrow 6$ linked dextrans. The hybridomas can be used to characterize the repertoire of the anti-dextran producing cells. In addition, we have these hybridomas available as an additional resource to use in the isolation of antigen-binding mutants.

In Dr. Christine Milcarek's laboratory the nuclear processing and gene structure of immunoglobulin γ_{2b} heavy chain mRNA is being investigated in mutant mouse myeloma cells. Variants of MPC-11 line 45-6 have been isolated by Dr. Sherie L. Morrison which produce internally deleted proteins. These variants simulate some of the features of human heavy chain disease. Raymond Monk, a graduate student in the laboratory has analyzed the mRNA's from the mutants and showed that some or all of the CH₁ domain has been deleted. However, the genomic DNA does not share these deletions. This implies that the internally deleted mRNA results through a defect in the hn RNA splicing from an only slightly altered DNA template. This is the first documented example of splicing mutants in the immunoglobulin system and may aid our understanding of the splicing process in other systems as well. The immunoglobulin genes of the mutants are being analyzed by DNA cloning into bacterial phage vectors, in collaboration with Dr. Morrison, and by examination of the DNA hybrids with normal immunoglobulin genes and mRNA in the electron microscope by Curtis Brandt, a graduate student.

Studies mRNA stability by Mr. Brandt have indicated that poly(A) is rapidly destroyed during heat shock in *Drosophila melanogaster*. This degradation results from activation of some pre-existing cellular component.

The laboratory of Dr. David H. Figurski is investigating the unique broad host range plasmids of the P-1 incompatibility group. At least four separate genetic regions of one antibiotic resistance plasmid of this group, RK2, are involved in the replication and maintenance of the plasmid in *E. coli*. From studies of these segments cloned on other plasmid vehicles, it has been shown that the regions code for functions that interact in a complex and fascinating way. One segment of DNA containing the RK2 origin of replication can be maintained stably in a bacterial cell as a separate plasmid molecule if other RK2 gene products are supplied *in trans* by hybrid plasmids carrying two of the RK2 regions of interest. However, the presence in the cell of only one of these two regions will ultimately result in the death of the cell, unless the second region is also present. Apparently, replication at the RK2 origin is dependent on a gene product from region 1 that may also be toxic to the cell in the absence of another gene product supplied from region 2. Furthermore, a gene product from region 2, perhaps the same one, is also required to prevent cell killing by expression of yet another region of the RK2 genome. However, this killing function is not essential for RK2 replication in *E. coli*. This work was conducted with Robert Pohlman and David Bechhofer (graduate students) and with Dr. Alice Prince. Current efforts in the laboratory are aimed at determining the exact functions of the gene products from these regions, the factors controlling their expression, and the mechanisms of their interactions.

The laboratory of Dr. Saul J. Silverstein has pursued its interest in introducing familiar genes into strange places. The emphasis during the past year has focused on three areas of research. The first represents a continuation of previous studies on the introduction, fate and expression of the DNA coding for the herpes simplex virus thymidine kinase gene into mammalian cells. In these studies the laboratory is concentrating their efforts on understanding the nature of phenotypic fluidity (the ability of these biochemical transformants to initially express the virus enzyme and then to subsequently repress synthesis in the face of an environmental insult to cells). This work is done in collaboration with the laboratory of Dr. Richard Axel and with the aid of Dr. Michael Ostrander and Ms. Adele El Karez and Mr. Steven Vogel. It has been recently demonstrated that cells which retain the virus gene but do not express it have

methyated the DNA sequences about the gene. This is direct evidence for a type of epigenetic regulation in higher eukaryotes.

Additional studies have focused on the production of a dominant acting eukaryotic vector with the intent of introducing any foreign gene into eukaryotic cells. For these studies Dr. Silverstein has utilized a mutant dihydrofolate reductase gene from Chinese hamster cells which renders cells resistant to high concentrations of the folate antagonist methotrexate. Cells transformed with this DNA become resistant to high concentrations of methotrexate. In addition, they have been able to demonstrate that this gene amplified in response to elevated levels of drugs. With purification of the gene it should become possible to ligate virtually any gene to this DNA, introduce it into a recipient cell and examine the effects of varying gene dosage on expression by altering the concentration of methotrexate in which the cells are grown.

The final area of interest is the introduction of a diverse variety of cloned eukaryotic genes into cells that should be capable of expressing these genes as luxury functions. In this vein they have introduced globin genes in Friend erythroleukemia cells and human growth hormone cells into a rat liver cell line. In each instance the recipient cell lines can be stimulated to produce a related naturally occurring product from endogenous template.

In the past year, the laboratory of Dr. Ramareddy V. Guntaka has concentrated on studies about methylation of avian tumor virus DNA in permissive and nonpermissive cells. Two graduate research assistants, Mr. S. Alex Mitsialis and Mr. Richard A. Katz, Dr. Prasad Y. Rao, a Research Associate and Dr. Guntaka demonstrated extensive methylation of cytosine residues in the integrated proviral DNA from nonpermissive rat cells as well as the endogenous viral sequences in permissive chick cells. In these two cases transcription of DNA into RNA is less efficient. In contrast to these, when chick embryo fibroblasts are exogenously infected with an avian tumor virus, no modifications of proviral DNA can be detected. Under these conditions at least 5,000 to 10,000 copies of viral RNA transcripts are synthesized.

Since in both cases where methylation is extensive only small quantities of viral RNA transcribed and if in the absence of methylation efficient transcription takes place it is proposed that a modulatory role for 5-methylcytidine in gene expression.

With three associates Dr. Guntaka has been able to study the integration pattern of viral genomes in XC cells. In these nonpermissive cells at least 15-20 copies of viral DNA are present per diploid cell

genome. The results can be summarized as follows: i) more than 80% of the genomes contain the *src* gene ii) at least 3 or 4 copies are integrated in a tandem fashion and iii) at least in 10-12 copies one particular BamHI site is lost and a new EcoRI site is acquired.

Together with Alex Mitsialis, Dr. Guntaka has been able to clone some of the viral DNA fragments in a plasmid vector, pBR322. These cloned DNAs are extremely useful as they provide large amounts of clean hybridization reagents in our studies on integration and post-integration modification of avian tumor virus genome.

Activities and Honors

Dr. Ginsberg presented seminars at Yale University, Brandeis University, Albert Einstein School of Medicine, University of Florida, and St. Louis University, and delivered papers at the Animal Virus and Cells Gordon Conference and the New York Academy of Sciences Symposium on Variations of Animal Viruses. He served as Chairman of the Microbiology and Infectious Diseases Advisory Committee of the National Institute of Allergy and Infectious Diseases, Chairman of the Microbiology Examination Committee of the National Board of Medical Advisors, and Councilor of the Virology Division of the American Society for Microbiology. He also served on the American Society of Microbiology Recombinant DNA Task Force, the Research Advisory Council of the American Cancer Society, the National Board of Scientific Advisors of the National Jewish Hospital (Denver, Colorado), and the Committee on Medical Education of the National Board of Medical Examiners. Dr. Ginsberg was appointed Editor of the *Journal of Virology* and is a member of the Editorial Board of *Comprehensive Virology*. He completed his terms as Editor of *Intervirology* and *Cancer Research*.

A symposium in honor of Dr. Kabat's 65th birthday was in the Hammer Health Sciences Building. The ten speakers and their topics were:

Dr. Michael Heidelberger—Reminiscences and Perspectives

Dr. Sherman Beychok—Recent studies on domain interactions in immunoglobulins.

Dr. David R. Davies—Three dimensional structure of antibody combining sites.

Dr. Rose G. Mage—Phenotypic expression of immunoglobulin genes. A model of complex regulation of gene expression and cellular differentiation.

Dr. Donald M. Marcus—Immunochemistry of the human P blood group system.

Dr. Ten Feizi—Immunochemistry of blood group I and i antigens.

Dr. Baruj Benacerraf—Fine specificity of thymus-derived lymphocytes and their receptors.

Dr. Joel W. Goodman—Hemolytic plaque formation by activated T lymphocytes.

Dr. Stuart F. Schlossman—The human T cell circuit.

Dr. Sten Hammarström—The use of lectins to characterize and fractionate lymphocytes.

Dr. Kabat had been Michael Heidelberger's first Ph.D. student and the others had all been graduate students, postdoctoral fellows and colleagues of Dr. Kabat. The Symposium was attended by former students, coworkers, colleagues and friends from many countries.

Work of the laboratories is supported by grants from the National Science Foundation, the National Institute of General Medical Sciences, a Program Project grant to Dr. Elliott Osserman from the National Cancer Institute, and a grant to the Cancer Center from the National Cancer Institute.

Dr. Pernis has given the following seminars and lectures: N. Y. U. seminar, "Clone interactions in the regulation of the immune response"; Pediatrics grand rounds, Babies Hospital, Columbia University "Regulation in the Immune system"; Univ. of Chicago Gehrman Lecture, "Clone regulation in the immune response"; Kantonsspital Basel, Basel, Switzerland, "Contributions of immunology to modern medicine"; Polycythemia Vera Study Group, New York, "The problem of idiotype control in tumors of B lymphocytes"; Harvard Italian Cultural Society, Cambridge, Mass., "Italian scientific contributions in American departments of biology and medicine and research institutes"; 57th Congresso Nazionale, Societa Italiana di Dermatologia e Sifilografia, Rome, Italy, "Basi immunologiche della ipersensibilita da contatto"; Mt. Sinai, New York, "Idiotype

control in the immune system"; Given Institute, Aspen, Colorado, "Etiology and Treatment in Cancer Biology"; Cold Spring Harbor Immunogenetics Course, "Network models of the immune system"; Mt. Sinai, New York, "Clonal control of B immunocytes".

Dr. Ellner gave a series of lectures to second year medical students in their microbiology course. Dr. Ellner also taught a course for graduate students in advanced clinical microbiology, and participated in the Aspen Course in Clinical Pathology. Guest lectures were given at Yale University, New York Medical College, Downstate Medical Center and at the Georgia and South Central Chapters of the American Society for Microbiology.

Dr. Erlanger presented seminars at the Pasteur Institute, Paris, France; at Merck, Sharp & Dohme in New Jersey and at the Centre Nationale de Recherche Scientifique (CNRS) in Orleans, France.

Dr. Augustin attended conferences and seminars at Arden House, P & S Biomedical Sciences Symposium; Stanford University, U.C. Irvine, UCLA, City of Hope National Medical Center; New York Club of Immunology.

Dr. Milcarek was invited to speak at Medical College of Ohio, Toledo, Ohio and the Ohio State Symposium on Gene Expression. Invited to present a paper and chair a session of the American Society for Cell Biology Meetings in Toronto, Canada.

Dr. Figurski was invited to speak at Pfizer Central Research Facility in Groton, Connecticut.

During the past year Dr. Silverstein was invited to present seminars at The University of Chicago, St. Johns University, The National Institutes of Health, The University of North Carolina, The University of Colorado, New York University, St. Jude's Research Hospital, The University of Connecticut, The University of Florida and at The American Society of Cell Biologists annual meeting in Toronto.

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Neurological Surgery

EDWARD B. SCHLESINGER

Byron Stookey Professor and Chairman • Director of Service

The graduating residents in neurological surgery have all obtained posts in consonance with their career choices. Dr. Stephen Dell has taken an academic post at Tufts' University School of Medicine and, in addition to his ongoing research program, has been placed in charge of the neurosurgical service at the affiliated Veteran's Hospital.

Dr. David Kvam remains with us as the Stocks' Fellow. He will have a two year tenure, the first of which consists in developing his skills in laboratory procedures, and in the second he will act as a clinical fellow. He has enthusiastically become involved in a number of research projects which will eventually have important clinical significance. One outstanding example is a study with John Owen, Karen Kaplan and Hymie Nossel related to the significance of platelet release and fibrinogen proteolysis associated with post-operative venous thrombosis. Ultimately it will be possible to make predictions about vulnerability and anticipated development of thrombophlebitis on the basis of these studies.

Dr. Gerald Kadis has obtained an unusually attractive post as the neurosurgeon in a very well equipped hospital in Georgia.

The ongoing resident group has maintained a tradition of excellence. The three senior residents have proven outstanding both in their clinical abilities and in their teaching and were excellent models for the younger group of residents and students.

The department's educational programs have become increasingly effective with important strength brought to the effort by Drs. Quest and Antunes.

Likewise their laboratory efforts, aided by the availability of our fine new laboratories, have given the resident group and the fellowship program real impetus. It has been possible to embark on a number of new studies. The labs have given the department the opportunity to more effectively train the resident staff in essential laboratory procedures and, in particular, microsurgical techniques. Dr. Quest was instrumental in helping set up the microsurgical training program with appropriate equipment, helped greatly by contributions from the Milton K. Raisler Foundation. The presence of Dr. Dobelle's neurophysiological laboratory close to our operating suite has been a valued acquisition. His group has been increasingly active in clinical studies related to cortical and visual prostheses. Further studies in this realm, both including the cortical placement of such prostheses and the study of patients whose implant occurred at earlier date, are contemplated. Drs. Antunes and Quest are the neurosurgical members of the research group. The presence of sophisticated neurophysiological devices in a clinical setting to allow recording intraoperatively has immeasurable value and potential for the future.

Dr. Correll and his group have continued their biochemical studies in their new location. He has been helpful in making available to the department his excellent equipment and the experience of his associates in his research on fat metabolism and its central nervous system control aspects.

The department participated in the All New York medical school annual neurosurgical course. The

course was well attended and successful in its educational efforts. The program for the ensuing year has already been outlined and preparations are being made for the course to be given yearly. As previously decided, it will be held at one of the medical schools involved as part of a regular rotation of site.

The department has been well represented in national neurosurgical affairs both in the administrative aspect of the national societies and in the society programs. The next AANS meeting will take place here in New York. It is the largest of the neurosurgical yearly meetings and the staff of the Institute is involved in the preparations for the meeting and also in scheduling appropriate local events for our returning alumni.

The resident staff has shown a gratifying interest in assembling papers. Their productivity and the quality of their contributions has been of a high order.

The attending staff and academic staff has continued to be active in research groups, with Drs. Carmel and Antunes functioning as integral parts of the neuroendocrine group which includes Drs. Earl Zimmerman and Michel Ferin et al, and our residents Drs. Philip Cogen and Kenneth Louis.

With Dr. Hilal, Dr. Michelsen continues to amass expertise in the management of arteriovenous anomalies of the nervous system. Their work has had repeated national exposure and has been well received.

Dr. Correll continues his special interest in cerebral vascular pathology and surgery and has collected a large series of cases. These undoubtedly will contribute to our fund of clinical knowledge about cerebral vascular phenomena and treatment.

Drs. Housepian and Brisman have continued to participate in the cancer therapy group. Institute effort has been strengthened by a new collaboration between the departments of neurology and neurosurgery in the field of cancer therapy. Dr. Housepian continues to work in the audiovisual field and has added a great deal to the department's reservoir of teaching material.

Drs. Brisman and Bridges have acted as the departmental representatives in the study of intractable pain. A departmental attempt is being made to add emphasis to this important aspect of neurosurgery.

Dr. McMurtry has extended his studies of aneurysms of the posterior circulation. He has developed skill and clinical experience in managing such lesions in his extensive clinical work both at Lenox Hill Hospital and here at the Neurological Institute.

Dr. Mount remains active clinically very much to the benefit of the department. His extensive and long term experience with aneurysms of the central nervous system continue to be most useful to all of us.

Early on a decision had been made by the department to concentrate types of special case material in individual hands so the staff could have a wide spectrum of expertise. Such skills can only be obtained by wide experience and intensive specialization. The plan has worked well and the department now combines a group of individuals each of whom in addition to a well rounded background in general neurosurgery has a field of special knowledge of academic value and also of clinical importance. These fields run the gamut from cerebrovascular surgery to the surgery of pain, pituitary surgery and spinal surgery. The development of effective liaison with the department of otolaryngology and ophthalmology has made it possible to increase the efficiency of team work in the management of pathology effecting these disciplines.

As has occurred routinely over the years, the operating statistics have shown an increase in case load with emphasis on special problems. These logically belong in an institution of academic stature and with access to special experience and equipment. Such a trend will undoubtedly continue throughout our country and the world. It is imperative that the department of neurological surgery have access to the necessary tools to make such ascendancy continuously possible. A small example is the improvement in critical information for proper clinical management of patients with increased intracranial pressure since adequate monitoring devices were added to our ICU armamentarium.

Dr. Kvam will be finishing his first year as a Stocks' Fellow and after July 1980 will phase into clinical teaching, patient care and clinic supervision. It is pleasant to report that the Stocks' fund was used well in giving Dr. Kvam the opportunity to develop research skills. The Stocks' Fellowship support and the actuality of our laboratories has made it possible to authentically start individuals in their development as academic neurological surgeons.

The stresses of the last year in terms of serious inflation and rigorous governmental controls had failed to dampen the high morale and outstanding efforts of our associates in patient care, particularly the nursing staff. Ms. McDonald and her group must be congratulated for maintaining, without interruption, a fine program of service as did the remainder of the neurosurgical nursing staff on the patient care floors.

Ms. Sawitzke, in her role as "nurse specialist" has been extremely helpful in bringing a personalized and humane atmosphere to the patients' bedside, making their anxiety stresses far easier for them to bear. Her advice in the management of special problems has also been much appreciated by the staff.

Mrs. O'Leary's efforts in the resident library have continued to be of her usual high quality and have made it possible to amass an excellent teaching collection.

The grand rounds visiting speakers have been uniformly excellent. The programs were arranged under the aegis of Drs. Antunes and DiGiacinto and both the talks and the preliminary lunches with the residents have been of value to the departmental educational program.

Dr. DiGiacinto continues to be valuable in teaching in spite of his heavy obligations with the Morningside group. It is hoped that he will find the

time to continue to cement our relationships with the neurosurgical service at our sister institutions.

I would like to thank the following generous donors for making many of our departmental programs possible, and for their understanding and vital support: The J.M. Foundation through Mrs. H. Lawrence Bogert, the Lewis M. Gabbe Foundation (Mr. William C. Mortensen, President), the Edward T. Gardner Foundation, the Harteveldt Foundation, the Gustav O. Leinhard Charitable Trust, The Harold K. Raisler Foundation, Inc., Mr. & Mrs. William R. Salomon, Mr. & Mrs. William S. Stocks.

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Neurology

LEWIS P. ROWLAND

Moses Professor and Chairman • Director of Service

1979 marked the end of an era for Neurology, not only at the Columbia-Presbyterian Medical Center, but in the world. H. Houston Merritt died on January 9 just 3 days before his 77th birthday. Chairman of this Department and Director of Service from 1948 to 1967, he was also Dean of the College of Physicians and Surgeons and Vice-President in charge of Medical Affairs from 1958 to 1970. Dr. Merritt, with Tracy Putnum, was responsible for the introduction of the anticonvulsant drug, phenytoin, in what was a major advance in the treatment of epilepsy. His *Textbook of Neurology* has been the standard for 25 years, and he had completed the 6th Edition just before he died. Many of his students became directors of training programs and heads of departments. He was influential in the establishment of what is now the National Institute of Neurological and Communicative Diseases and Stroke and served as officer of virtually all professional societies and voluntary health agencies concerned with neurological diseases. His many accomplishments and awards have been recorded in several obituaries. His influence at the Columbia-Presbyterian Medical Center will be perpetual, as succeeding generations of students will be encouraged to emulate his scientific humanism.

1979 also marked the 50th Anniversary of the Neurological Institute at its present location and the 70th Anniversary of the founding of the Institute. To celebrate the occasion, the Alumni Association of the Neurological Institute sponsored a symposium on therapeutic advances and a banquet that evening was

attended by more than 250. Dr. Peter Carmel, Associate Professor of Neurosurgery, gave a multi-media history of the Institute and its relationship to Columbia.

Teaching

Professor Lucien Cote continued to coordinate clinical aspects of the Neural Science course for the second-year students. He and other members of the Department gave lectures and supervised 27 groups of 5 students each for instruction at the bedside.

One hundred and fifty students in the major clinical year took the 5-week neurology clerkship at the Neurological Institute under the direction of the clerkship administrator, Dr. Stuart Snider. The Clerkship was given the highest overall rating of Major Clinical Year clerkships on student questionnaires in 1978-1979. Teaching skills of residents and exposure to a great variety of neurological disorders during the Clerkship were singled out by the students. The need to emphasize neurological diseases that are encountered by primary care physicians was acknowledged by focusing student teaching sessions on common problems and expanding the outpatient experience in the Clerkship.

Professor Earl A. Zimmerman coordinated the Elective courses, which were taken by 70 P&S seniors and 28 students from other schools as follows: subinterns, 16; consultation services, 21; preceptor experience, 4; laboratory research, 4; pediatric neurology, 22; Harlem Hospital, 8; Mary Imogene Bassett Hospital, 4; and St. Luke's Hospital, 1. Eight

students participated in a seminar on concepts of neurology.

Graduate Medical Education: 24 physicians served as residents in the adult neurology training program at Presbyterian Hospital and the Harlem Hospital Center. Seven physicians served in the pediatric neurology training program at Presbyterian Hospital.

In addition to the usual lectures and conferences, Professors Cote, Reuben, and Housepian organized a weekly review course in basic neurosciences for clinicians. New conferences were organized for Gross Neuropathology and Neuroradiology. These courses, Grand Rounds, are accredited for Continuing Medical Education and Child Neurology Conferences.

Visiting Lecturers included J. Blass (Cornell), F. Buchthal (Denmark), H. Cathala (Paris), S. Coole (New Jersey), J. Ekstedt (Sweden), S. Feldman (Israel), N. Geschwind (Harvard), R. Grossman (Galveston), I. Hausmanowa-Petrusewicz (Poland), W. Hooper (Australia), J. Lance (Australia) and J. Ochoa (Dartmouth).

Research

Epilepsy Research

Alfred Salazar, Leonard Zablow and Professor Goldensohn are engaged in studies on penicillin as an epileptogenic agent including its localization and diffusional kinetics and its effects on single cells in the cerebral cortex. Dr. Pedley completed studies begun during the previous year on changes in regional cerebral blood during experimental generalized seizures. Dr. W.A. Hauser initiated an epidemiological survey of epilepsy in Northern Manhattan.

Dr. C.E. Pippenger, Director of the Edwin S. Weiss Sr. Laboratory for the Analysis of Antiepileptic Drugs, investigated antiepileptic drugs and seizure control in children; improved techniques for determining free concentrations of antiepileptic drugs; and studied the role of trace elements in seizure disorders. Emphasis is given to development of improved non-invasive techniques for quantitation of serum antiepileptic drug concentrations. A new device was developed for measurement of free drug concentrations and the ability of antiepileptic drugs to alter trace element distribution has been established. Responsibility for the continuation of the national Antiepileptic Drug Levels Quality Control was assumed by the American Association for Clinical Chemistry.

Drs. Richard L. Masland and Stanley R. Resor, Jr. are investigating several new anticonvulsants: valproic acid, nitrazepam and cinromide. Dr. Resor and Dr. Nabil Husami (Dept. of Obst-Gyn) are

studying the relationship between gonadotropins and catamenial epilepsy.

Parkinson Disease Research

Drs. Stanley Fahn, Lucien Cote, Stuart Snider, and Robert Barrett continued a long-term evaluation of the efficacy and toxicity of bromocriptine in the treatment of parkinsonism. They found this drug to be of limited benefit and of considerable toxicity. It may be useful as an adjunctive drug in combination with levodopa for patients who have problems improving with levodopa alone. Drs. Fahn, Snider and A.L.N. Prasad studied the effects in rats of a catechol-O-methyltransferase inhibitor with levodopa administration, and showed that this drug is effective *in vivo*; the drug has therapeutic potential in the treatment of human parkinsonism. Drs. Fahn, Snider, Cote, Barrett, and Ronald Lesser analyzed the clinical problems in parkinsonism and the complications of long-term levodopa therapy. They found that levodopa tends to lose efficacy with long-term use and recommended that therapy with this drug should be delayed until the symptoms are sufficient to warrant its administration.

Drs. Fahn and Barrett observed that levodopa toxicity, in addition to its well-known symptoms, can also cause symptoms of increased parkinsonism. This complication of levodopa therapy may account for some patients who presumably are not responding well to levodopa. Dr. Fahn reviewed the syndrome of posthypoxic action myoclonus and also reported that valproate and estrogen can be effective agents in controlling some of the symptoms of this disorder. Dr. J. Sharma (post-doctoral Fellow), Dr. Emil Heisiger (medical student), Dr. Snider and Dr. Fahn attempted to produce posthypoxic action myoclonus in the rat, but were able only to produce transient myoclonus and not permanent myoclonus.

Dr. Fahn found that high dosage anticholinergic medication can effectively reduce dystonic movements in children with dystonia musculorum deformans. Dr. David Forrest (Psychiatry) and Dr. Fahn hypothesized on the potential development of tardive dyskinesia in patients withdrawn from chronic neuroleptic medication. Drs. Prasad and Fahn measured GABA levels and CSF in neurologic patients and found that a reduction of GABA content is not specific for Huntington Disease, and can be found in many other movement disorders.

Dr. Richard Mayeux studied the effects of depression on cognitive function in Parkinson disease, and evaluated the use of desmopressin (dDAVP) in the treatment of Alzheimer disease.

Drs. Lucien J. Cote and Leon Kremzner (Neurology) have completed a study of the turnover rates of

monoamine oxidase (MAO), acetylcholinesterase (AChE), ornithine decarboxylase (OD), and S-adenosylmethionine decarboxylase (SAMDC) in brains of mice. They observed no significant difference in the rates of turnover of MAO and AChE with age. However, in the case of enzymes with rapid turnover times (such as OD and SAMDC), a delay in the induction of these enzymes was delayed in older mice. Once initiated, however, they reached the same levels of activity as in young mice.

Drs. Lucien J. Cote, Joyce Ilson (Senior Neurology Resident), and Mrs. Karen Russo have established a clinical laboratory to assess the function of the human peripheral autonomic nervous system. The goal is to investigate functional changes in the peripheral autonomic nervous system associated with aging and in neurological diseases such as parkinsonism, Shy-Drager syndrome, and dementia.

Drs. Downey, Cote, Crawshaw, and Kronenberg, in collaboration with the Department of Obstetrics and Gynecology, are continuing studies of the pathophysiology (changes in temperature, blood flow, and cardiac function), and endocrine changes (e.g., polypeptides) during hot flashes associated with menopause.

Dr. Cote and associates are studying alterations in neurotransmitter-synthesizing enzymes as related to age, and in neurological diseases. Profound changes in enzymes involved in the synthesis of catecholamines occur with age. This observation suggests that physiological events associated with age, such as changes in gait, posture, memory, sleep pattern, and temperature regulation, may be related to changes in neurotransmitter system in the aged.

Drs. Stuart R. Snider, and Ray S. Snider investigated cerebellar influences on brain catecholamine metabolism. They used the excitotoxic agent, kainic acid, and a recently developed method of brain stimulation, focal electrothermal warming, to alter cerebellar activity in rats.

Dr. Leon Kremzner is investigating the metabolism and function of polyamines. Kinetic studies, in collaboration with Dr. Richard Ambron (Anatomy), demonstrated that polyamines are transported by simple diffusion in an identified neuron of *Aplysia*. With Dr. John Sturman (Institute for Basic Research in Mental Retardation), Dr. Kremzner studied the metabolism of putrescine and its relationship to the polyamines in developing monkey brains. As part of studies of altered polyamine metabolism in diseases, Drs. Kremzner and Clayton Natta (Pathology) studied the binding of polyamines to red cell stroma. It was shown, in sickle cell disease, that the stroma binds 2 to 10 fold more spermine. With Drs. Cote, Sol Berl (Mt. Sinai Medical School) and Stanley

Stellar (St. Barnabas Medical Center), Dr. Kremzner showed, in brain, a significant reduction in specific amino acids, including GABA and the dipeptide, homocarnosine, in Huntington disease.

Neuroendocrinology Research

Associate Professor Earl A. Zimmerman investigated brain peptides in neuroendocrine mechanisms and extrahypothalamic pathways in several mammalian species, including humans. Drs. Gajanan Nilaver, Gary Abrams (Fellow), Richard Defendini (Neuropathology) and Zimmerman, in association with Dr. Dorothy T. Krieger (Mt. Sinai, N.Y.), established that ACTH and β -endorphin are formed in the same neurons of the hypothalamus and are transported to many other brain regions. Dr. Zimmerman and Dr. Ann-Judith Silverman (Anatomy) discovered that the vasopressin-oxytocin system is connected to and, therefore, is probably regulated by serotonergic and dopaminergic systems as well as containing norepinephrine. Drs. Nilaver, Haldar and Zimmerman also established that secretion of oxytocin and vasopressin is regulated centrally by substance P and β -endorphin. With Drs. Michael Ferin (Physiology), John Antunes, and Peter Carmel (Neurosurgery) of The Center for Reproductive Sciences, Dr. Zimmerman showed that the *pars tuberalis* of the pituitary gland of monkeys produces gonadotropins. Dr. Anna Y. Hou, a Fellow from the Republic of China, continued the work of Dr. David Kahn (P&S 1979) and established that this peptide acts on neuroendocrine systems at the synaptic level as well as directly on the pituitary gland. Dr. Katherine B. Sims (P&S 1979) mapped vasoactive intestinal polypeptide pathways in brain; the new data suggest that it may regulate diurnal rhythms and pain mechanisms in addition to cortical function and cerebral blood flow. Dr. Zimmerman, with Dr. Margaret Kilcoyne (Medicine), studied brain angiotensin and hypertension, and found evidence that this peptide is produced in neurons. Dr. Elizabeth Matthew (Canadian MRC Fellow) established that there are up to a million receptors for diazepam per cell in culture, and that the drug can affect differentiation.

Dr. Dominique Toran-Allerand studied the organizational role of gonadal steroid hormones and alpha-fetoprotein on the development of the mammalian brain, using tissue cultures of fetal and neonatal rodent brain. With Drs. Bruce McEwen (Rockefeller University) and Neil MacLusky (Yale University), Dr. Toran-Allerand is studying estradiol and testosterone receptors and their ontogeny, autoradiographic localization of steroids, and steroid effects on protein and glycoprotein biosynthesis. With Dr. J. Brawer (McGill University), she is

studying the electron microscopic correlates of the steroidal effects on the cultures and, with Dr. W. T. Greenough (University of Illinois), she is carrying out computer analyses of steroidal effects of differentiation in Golgi-Cos-stained cultures. Dr. Toran-Allerand has been carrying out immunocytochemical (immunofluorescence) studies on the interneuronal localization of alpha-fetoprotein in the developing mouse brain and, with Drs. James Roberts and Beth Schacter (Biochemistry and Center for Reproductive Sciences), she is studying its possible intraneuronal biosynthesis by means of cDNA probes for the RNA for alpha-fetoprotein.

Neurovirology Research

Dr. James R. Miller, with Dr. Ramareddy V. Guntaka (Microbiology) and Dr. Jeanne C. Myers (Cancer Research Institute) found that poliovirus nucleic acid could not be detected in the brain cells of patients who died of amyotrophic lateral sclerosis. They prepared a radioactive nucleic acid probe that was complementary to the genome of the virus and used it to detect virus genetic material by hybridization techniques. The method was sensitive enough to have detected a single viral genome per brain cell. Although this is an extremely sensitive method for detecting virus, Dr. Miller found in collateral animal experiments that virus could still be present and escape detection by hybridization techniques.

Dr. Miller is also studying a prolonged asymptomatic infection in mice inoculated intracerebrally with poliovirus. The animals have been shown not to make antiviral antibodies that are circulating in the blood or present in the brain. Investigations are in progress to define other host and viral factors that regulate viral replication. Understanding the mechanisms involved will allow a rational approach to the potential etiologic role of polio and similar viruses in chronic human neurologic diseases.

Dr. Miller continued the electrophoretic analysis of immunoglobulins in cerebrospinal fluid of patients. The procedure is now regularly used in the Medical Center as a valuable adjunct in the diagnosis of multiple sclerosis.

An assay for detection of immune complexes in serum and spinal fluid was developed by Dr. Miller. Fluctuations of immune complex levels in the serum of patients undergoing plasmapheresis were studied. The prognostic significance of elevated immune complex levels is being evaluated. With Dr. Penn, Dr. Miller is correlating the presence of abnormal levels of immune complexes with titers of anti-receptor and anti-muscle antibodies in myasthenia gravis.

Assistant Professor Eugenia Gamboa examined factors that affect the myotropism of influenza virus. With Dr. Hays (Pathology) and Dr. Mong (Visiting Fellow), viral myositis was examined in nude mice and in immunocompetent Balb-C mice. Both pathology and detection of viral antigen were altered in nude mice, indicating that immune mechanisms are important in viral myopathy. With Dr. A. Miranda and Dr. R. Valderamma, Dr. Gamboa examined the effect of neuromuscular block on replication of influenza virus in fused human muscle cultures. The amount of virus recovered and the cytopathologic changes induced by influenza virus were decreased in the presence of neurotoxin. With Mohamed Aqeel Ahmed and Dr. A.S. Penn, Dr. Gamboa found similar behavior of influenza virus in thymic cultures from controls and patients with myasthenia gravis. With Dr. Jacobiec and Srinivasan (Ophthalmology), Dr. Gamboa isolated herpes simplex virus from an adult with recurrent blepharitis, previously reported only in children.

Brain Tumor Research

Assistant Professor Arnold E. Eggers studied chemical enhancement of tumor antigenicity. Murine spleen cells were immunized *in vitro* against syngenic tumor cells left unmodified with various chemical determinants. The splenocytes were harvested after 5 days and run in a short-term chromium-release assay with unmodified tumor target cells. Splenocytes immunized against the modified but not the unmodified tumor cells lysed the unmodified target cells. Studies were performed on the specificity requirements for the mode of attachment of the chemical moieties and on cross-reactivity of target cells. Preliminary studies suggested that the same approach can be used to increase the antigenicity of guinea pig tumors, which would provide a better model for *in vivo* immunotherapy experiments.

Dr. Eggers also worked on a short-term chromium-release assay that can detect lymphocytes sensitized against myelin basic protein in experimental allergic encephalomyelitis. This assay can detect a class of effector cells (Ly 23 in the mouse) which are important in such immunological phenomena as graft rejection and which may be missed by other assays (e.g. ³H-thymidine uptake, MIF, both of which measure primarily Ly 1+ effector cells). Such an assay could be of use in understanding the pathophysiology of multiple sclerosis.

Dr. Michael Fetell, Assistant Clinical Professor, and Dr. Eggers participated with the Oncology section in therapeutic trials for patients with brain tumors and carcinoma of the meninges.

Biochemical Genetics

Dr. Johnson continued his studies of the molecular genetics of hexosaminidase and the clinical spectrum of hexosaminidase deficiency diseases. In collaboration with C.S. Cohen and Drs. Miranda, Waran, and Chutorian, he described a new hexosaminidase deficiency disorder, the juvenile G_{M2} -gangliosidosis genetic compound, in a patient with dementia, myoclonus, ataxia, and cherry-red spots. Extensive family studies showed that the father's family carried the Tay-Sachs allele, HEX^2 , while the mother's family carried a milder-locus allele, possibly a new allele, HEX^7 . This was the first hexosaminidase compound with the phenotype of juvenile G_{M2} -gangliosidosis. The finding has important implications for Tay-Sachs population screening and for prenatal diagnosis.

Dr. Johnson developed a new method of separating hexosaminidase S in a single step from other hexosaminidases in quantities sufficient for detailed characterization of kinetic and stability properties. In addition, he developed improved methods for classifying hexosaminidases, A, B, and S.

Dr. Johnson, in collaboration with the Presbyterian Hospital, has made available a battery of lysosomal hydrolase enzyme assays and other assays as routine patient diagnostic tests.

Dr. Johnson began studies of X-linked phosphorylase kinase deficiency in collaboration with Dr. S. DiMauro and has studied the kinetic and stability properties of phosphorylase kinase isozymes in liver muscle, and leukocytes.

H. Houston Merritt Clinical Research Center for Muscular Dystrophy and Related Diseases

In collaboration with Dr. Dimitris Agamanolis, (Children's Hospital, Akron, Ohio), and Dr. Arthur Hays, Professor Salvatore DiMauro studied two patients with muscle phosphofructokinase deficiency. Accumulation of abnormal polysaccharide resembling amylopectin was found in approximately 10% of muscle fibers, a feature not previously observed in this genetic disease. With Dr. Hays and Dr. Mark Hallet, (Peter Bent Brigham Hospital, Boston), Dr. DiMauro found a new clinical variant of phosphofructokinase deficiency in a 60-year-old woman with progressive proximal weakness for 5 years, but no history of cramps or myoglobinuria.

With Drs. Armand Miranda, Gerda Nette and Patricia Hartlage (Medical College of Georgia, Atlanta), Dr. DiMauro studied isoenzymes of phosphorylase in the heart of a baby with a fatal infantile variant of myophosphorylase deficiency. The presence of abundant heart-specific phosphorylase may explain why patients with adult McArdle disease do

not have cardiac symptoms.

With Dr. Armand Miranda, Dr. DiMauro showed that in myoadenylate deaminase deficiency, a newly-described genetic muscle disorder, the enzyme defect is not expressed in muscle culture. This is probably due to the presence, in developing muscle, of a fetal isoenzyme, under separate genetic control from the adult muscle enzyme, a situation already documented in McArdle disease.

Dr. Joseph Willner, in collaboration with Drs. Cesare Cerri, an MDA Fellow from the University of Milan, and Donald Wood, continued research on the cause of malignant hyperthermia. Dr. Wood found that single, skinned fibers from malignant hyperthermia muscle were hypersensitive to caffeine, an observation consistent with an acceleration of calcium transport by sarcoplasmic reticulum. Because SR calcium transport is stimulated by cyclic AMP, Dr. Willner examined cyclic AMP metabolism in skeletal muscle of patients with malignant hyperthermia; he found that cyclic AMP content of the muscle was increased, due to increased activity of adenylate cyclase, with normal activity of cyclic AMP-dependent phosphodiesterase.

Dr. M. Olarte conducted a double-blind, cross-over trial of levamisole in the treatment of amyotrophic lateral sclerosis with Drs. S. Shafer and L. Rowland. With Drs. R. Schoenfeldt and A. Penn, Dr. Olarte directed the plasmapheresis program, supervising the performance of 460 treatments in 40 patients. They found that this treatment is very effective in myasthenia gravis and some forms of peripheral neuropathy with plasma cell dyscrasia, and may be effective in polymyositis or dermatomyositis. The technique was of no value in patients with amyotrophic lateral sclerosis.

Associate Professor Audrey S. Penn compared the sensitivity of different antigens in assays for antibody to acetylcholine receptor. She provided evidence that these antibodies differ from striation-binding antibodies that are also found in patients with myasthenia gravis. She demonstrated that clinical expression of neonatal myasthenia is related to high antibody titers in both mother and infant. With Dr. Christopher Bever, Research Fellow, and Assistant Professor Hai Won Chang, Dr. Penn initiated a study of the interaction of D-penicillamine and the receptor. Dr. Bever initiated a study of the natural history of ocular myasthenia gravis.

Professor Robert E. Lovclace studied the relation of miniature end plate potentials in the infant as recorded extra- and intracellularly, with Dr. D. Barone, Robert Bilder and David Berger. Human nerves were studied *in vitro* with Drs. Galassi and Aquino. Dr. N. Singh, with Dr. K. Sachdev, studied

human nerve conduction and evoked potentials. Dr. Lovelace completed studies on experimental diabetes in the rat with Dr. P. Bouche and Ms. Marylyn Stark. Dr. Singh is also collaborating with Dr. Stanley Fahn in the EMG assessment of Shy-Drager syndrome and dystonias. Dr. Devi studied re-ennervation of the facial nerve territory after transplantation of the hypoglossal nerve. Dr. G. Galassi collaborated with Dr. A. Hays and Dr. A. Eastwood in a morphometric study of the sural nerve in sarcoidosis.

The laboratory of Dr. Arthur Karlin continued research on the molecular properties of acetylcholine receptors. Dr. Vinayak Damle demonstrated a profound change in receptor conformation upon binding of agonists but not antagonists. Dr. Susan Hamilton found that a major component of receptor-rich membrane resembles actin and may be involved in receptor localization. Mr. Rashad-Rudolf Kaldany found that a covalently-reacting fluorescent reagent may label a local anesthetic binding site in receptor-rich membrane. Dr. David Wise determined the shape of the receptor by neutron scattering and electron microscopic analysis.

Research carried out under the direction of Dr. T. Rosenberry and Dr. Hai Won Chang was concerned with the biochemical properties of proteins involved in the excitability of nerve and muscle tissue. Dr. Rosenberry, with Dr. Philip Barnett isolated and studied the structure of the collagen-like subunits that attach acetylcholinesterase to membranes in synapses. They also investigated the structure of human erythrocyte acetylcholinesterase. Dr. Chang and Mr. Ernest Bock studied conditions required for the isolation of acetylcholine receptor in a form which retains native structure and function. They quantitatively characterized the classes of sulfhydryl groups in the receptor and identified their distributions among the four receptor subunits. Dr. Chang worked at the Max Planck Institute for Biochemistry in Munich, Germany, where she collaborated with Dr. Eberhard Neumann in relaxation kinetic studies of calcium-binding to the purified receptor.

In the Physiology Laboratories Drs. Katz, Mozo and Reuben studied the kinetics of contractile protein interactions and conformational changes in single intact and skinned muscle fibers employing light scattering techniques. Drs. Sorenson and Salviati determined the characteristics of the sarcoplasmic reticulum in normal and diseased human single fibers by light scattering measurements. Drs. Kawai, Brandt and Cox studied kinetics of cross-bridge movements in single skinned fibers by dynamic stiffness measurements. Drs. Wood, Sorenson and Reuben studied the force generating and Ca-regulating properties of normal and diseased human single fib-

ers. Drs. Wood, Sorenson and Salviati studied the role played by C-AMP in modulating Ca-regulation in mammalian fast and slow twitch fibers. Dr. A. Eastwood is studying the structure of chemically skinned mammalian skeletal muscle and morphological aspects of calcium regulation in chemically skinned fibers.

Harlem Hospital Center

Dr. John C.M. Brust continued as Director of the Department of Neurology and Dr. Edward B. Heaton as Assistant Director. Drs. Heaton and Brust presented papers on familial cerebellar degeneration and on hypertensive encephalopathy. Dr. Brust also presented a study of musical alexia and agraphia. Dr. Yasoma Challenor, Chief of the Electrodiagnostic Laboratory, continued on the Board of Directors of the American Association of Directors of the American Association of Electromyography and Electrodiagnosis and was named Chairperson of the Membership Liaison Committee. She and Dr. Brust conducted a study of peripheral neuropathy in sarcoidosis.

Twenty-seven students, several from other medical schools, took the Harlem Hospital Fourth Year Neurology Elective. More than 600 patients were admitted to the Neurology Ward, and more than 2000 were seen in consultation. 1341 electroencephalograms and 475 electromyograms were performed.

Service

New Diagnostic Tests: Research in departmental laboratories in the past few years led to development of several tests that are now available for routine diagnosis. Among these tests are anticonvulsant drug levels (Dr. C.E. Pippenger), oligoclonal bands in cerebrospinal fluid for the diagnosis of multiple sclerosis (Dr. J.R. Miller), and assays for lysosomal enzymes in diagnosis and for carrier detection (Dr. W.G. Johnson). New tests are being developed for diagnosis of myasthenia gravis by assay of antibodies to acetylcholine receptor (Dr. A.S. Penn) and the evaluation of autoimmune disorders by measuring immune complexes (Dr. J.R. Miller). Other new diagnostic procedures include measurement of visual evoked responses and brain stem auditory evoked responses (Drs. Goldensohn, Sachdev, Pedley) and somatosensory evoked responses (Drs. Singh and Sachdev). In the EMG laboratory, Drs. Lovelace and Singh have introduced new methods to measure nerve conduction velocities and reflex functions in patients.

New Therapeutic Service: Also initiated as a research project, the Neurological Service has initiated

use of plasmapheresis for the treatment of myasthenia gravis and other immunological diseases.

Clinical Activities: The following data measure clinical activities:

	1976	1977	1978	1979
Admissions				
Ward Adult	1763	1143	1147	1166
Private Adult	2851	2400	2207	2510
Pediatric Adult	790	717	805	690
Clinic Visits				
Adult	9365	9920	9127	10,173
Pediatric Neurology	2340	2636	2481	2478
Private Office Visits				
Adult and	8721	11,126	10,812	11,962
Pediatric Neurology				
Deaths				
Adult	156	127	167	155
Pediatric Neurology	—	—	—	
Autopsies				
Adult	37	38	42	42
Pediatric Neurology	—		—	
EEG Examinations	7200	7120	6900	7066
EMG Patients	1942	2124	1978	2114
EMG Examinations	3671	3962	3609	4038

Activities

Dr. Gary Abrams, Research Fellow, was awarded a fellowship by Mrs. Lucy G. Moses for brain peptide research in England.

Professor Emeritus Sidney Carter was President of the American Neurological Association.

Professor S. DiMauro was invited to lecture at meetings of American Association of Electromyography and the International Society of Neurochemistry; the Frank Graig Memorial Conference; postgraduate courses at Baylor University and Washington University; and at the Universities of Arizona, Ohio State, Pennsylvania, and Mt. Sinai Medical Center.

Professor Darryl C. DeVivo was appointed to the Study Section of the General Clinical Research Centers program of the National Institutes of Health. He was an invited lecturer at the annual meeting of Puerto Rican Medical Association and at an NINDS symposium on Cerebral Metabolism and Neural Findings. He also lectured at the Morristown Hospital and in a postgraduate course at Washington University. Dr. DeVivo serves as an Associate Editor of the *Annals of Neurology* and on committees of the American Neurological Association and the Child Neurology Society.

A. Eastwood, Assistant Professor of Anatomy (in Neurology), lectured at the University of Maryland.

Assistant Professor Arnold E. Eggers was certi-

fied by the American Board of Psychiatry and Neurology and was the recipient of a Teacher-Investigator Development Award from the NINCDS.

H.H. Merritt Professor Stanley Fahn was elected Fellow of the American Academy of Neurology and was appointed to a Special Review Committee on Positron Emission Tomography of NINCDS. With Dr. Rowland and James Davis (Duke University), Dr. Fahn edited a book on *Cerebral Hypoxia*. Dr. Fahn organized a Symposium on Therapeutic Controversies in Movement Disorders for the American Neurological Association and lectured at several medical schools (Mt. Sinai, Tennessee, Tufts, NYU, Rochester, Yale, Albert Einstein-Montefiore) and hospitals (St. Vincent's Carrier Clinic, Nassau, Bergen Pines).

Professor Arnold P. Gold lectured at Brown University, the South African International Conference on Epilepsy, at the University of Witwatersrand, and in Venezuela.

Professor Eli S. Goldensohn was appointed to the National Task Force for the Implementation of the Recommendations of the National Commission on Epilepsy. He was elected Corresponding Member of the Peruvian Society of Electroencephalography and Clinical Neurophysiology. He was the guest speaker at the Iberian American Neurological Congress in Lima. He gave many invited lectures including IVth Annual Charles D. Roberts Symposium at the Englewood New Jersey Hospital and the Symposium on Epilepsy at the Philadelphia Neurological Society. He directed the Annual Course in Clinical Electroencephalography at the American Academy of Neurology and continued as a member of the Board of Directors of the American Board of Qualification in Electroencephalography. He is Vice President of the Epilepsy Foundation of America. He was made a Consultant to the New York State Commission for Quality Care for the Mentally Disabled.

Assistant Professor William G. Johnson was elected to active membership in the American Society of Human Genetics and to active membership (on the basis of meritorious contributions) in the Child Neurology Society. Dr. Johnson lectured at the National Tissue Culture Association, Northeastern Branch, and at New York Medical College.

Professor Arthur Karlin served on the Editorial Boards of *Molecular Pharmacology* and of the *Journal of Biochemistry*.

Assistant Professor M. Kawai was an invited participant at the International Biophysical Meetings in Japan.

Professor Robert E. Lovelace lectured at the Universities of Umea (Sweden), Wurzburg (Germany) and Paris (France).

Niels Low, Professor of Clinical Neurology and Pediatrics, was President of the International Child Neurology Congress in Sydney, Australia.

Assistant Professor James R. Miller was awarded a George Carden Fellowship for research in neurovirology and immunology.

Assistant Professor of Clinical Neurology Marcello Olarte was awarded the Ezard Charles Fellowship of the Muscular Dystrophy Association.

Professor Emeritus David Nachmansohn published *German-Jewish Pioneers in Science, 1900-1933*, a book on the history of science in Germany before the Nazi period.

Assistant Professor Charles E. Pippenger was selected as Editor-In-Chief for a new journal, *Therapeutic Drug Monitoring*.

Professor John Reuben was Director of the Grass Fellowship Program at the Marine Biological Laboratories in Woods Hole, Massachusetts.

Professor Lewis P. Rowland was the first Rogowski Memorial Lecturer at Yale University and Ruth Paterson Memorial Lecturer at Tulane University. He served as Robert Aird Visiting Professor at the University of California, San Francisco, and was President-Elect of the American Neurological Association. He lectured at the Hebrew University and the Weizman Institute in Israel.

Dr. Dominique Toran-Allerand was awarded a Research Scientist Development Award from the National Institute of Mental Health (NIMH) and research grants from the National Foundation/March of Dimes and the W.T. Grant Foundation. She was a lecturer at Harvard Medical School; University of Illinois; Rutgers Medical School; New York University School of Medicine; Rockefeller University, Fordham University, and the Institute for Animal Behavior (Rutgers University). She was an invited participant at the Winter Conference for Brain Research, at an International Symposium on Hormones and Brain Development in East Berlin; at the Inter-

national Academy of Sex Research in Prague, Czechoslovakia, and a course lecturer at the American College of Obstetrics and Gynecology.

Assistant Clinical Professor Hyman G. Weitzen was appointed to the Board of Directors of the National Council on the Aging.

Assistant Professor Joseph Willner was certified by the American Academy of Psychiatry and Neurology and received a Teacher-Investigator Development Award from NINCDS.

Departmental members who lectured in courses at the Annual Meeting of the American Academy of Neurology included Drs. Carter, Chutorian, DeMauro, DeVivo, Fahm, Goldensohn, Johnson, Penn, Rowland, and Zimmerman. Drs. DiMauro, Olarte, Willner and Wood lectured in a course in Surinasm.

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School of Nursing

HELEN F. PETTIT,
Associate Dean (Nursing)

Programs

The first joint degree between the School of Nursing and another school of the University was approved by the University Senate in January 1979. The program is offered jointly with the School of Public Health and leads to a Master of Science/Master of Public Health degree.

The major responsibility for the development of the program was undertaken by Lucie Kelly, R.N., Ph.D., who holds a joint professorial appointment between the two Schools, and the School's Graduate Curriculum Committee. Support of the Kellogg Foundation was instrumental in helping to make this advance possible.

The projected track in gerontological nursing, the third offering in the area of nurse practitioner, admitted its first students in September. Eileen Quinlan, the primary faculty member in this field, has established her own practice in senior citizen centers in ways that enhance this program.

A program for the preparation of the Nurse Anesthetist was developed during the year. This development evolved from the excellent course offered by the Roosevelt Hospital since 1964. Elsie Svozil, the director of that program, worked with the graduate curriculum committee and its Chairman, Dr. Messler, R.N., Ed.D. Consultations with the New York State Education Department and the National League for Nursing encouraged the faculty. Drs. Henrik Bendixen and Ronald Andree, Chiefs of Anesthesiology at the Presbyterian and Roosevelt Hospitals, respectively, have given impetus as well as support.

Dr. Bernadette Fiscina, M.D., Staff Associate in Pediatrics, and Dr. Constance Park, M.D., Assistant Professor, Medicine, assumed responsibility for planning and coordinating physician input in the programs in Pediatric Ambulatory Care Nurse and the Adult Nurse Practitioner respectively. Their cooperation, assistance, and enthusiasm are greatly appreciated. The support of Dr. Cunningham and Dr. Stewart has contributed markedly to the success of these programs.

Evaluation of both the graduate and undergraduate programs is continuing to be addressed. Specific courses, including clinical practice evaluation, are being analyzed to assist in ongoing program improvement. Data from graduates and their employers (the latter at one-year intervals for three years) are being collected for further assessment of the undergraduate program.

Faculty in the graduate programs have been examining program evaluation systems and, after consultation, have been working with Goal Attainment Scaling. Protocols were established to permit program and course evaluation. This work will continue.

Total School evaluation was a major activity of the faculty in preparation for the review of the program by the National League for Nursing and the American College of Nurse-Midwives during 1979-1980. An extensive written report was completed at the end of the summer. Constance Cleary assumed a large measure of responsibility for this.

Another dimension of evaluation was initiated in April of 1979. A questionnaire was prepared by a faculty task force chaired by Mary Smith and dis-

tributed to five thousand graduates of all programs of the School. The data solicited are comparable to that completed in 1966. The present intent is to obtain or update information regarding the various uses to which educational preparations were put. The latter was to be assessed in terms of leadership positions held and graduate education pursued. Assessment of curricula experienced was solicited. Analysis of the data will provide a base for future curriculum planning.

Field Students

Practice teachers from Teachers College were precepted by nursing faculty again this year. Five were in the area of Medical-Surgical nursing, two in Community Health, and one in Psychiatric nursing.

Continuing Education

Programs offered in 1978-79 were coordinated through Bonita Schulze, Chairperson of the Continuing Education Committee, who worked as liaison with the Director of the Continuing Education Center. Programs offered by the School of Nursing were included in a bulletin with continuing education offerings from other schools on the Health Sciences campus.

"Nursing Care of the High Risk Neonate" was co-sponsored with the Neonatal Units, Babies Hospital. This basic course was designed for neonatal nurses from Level I and Level II hospitals who are primary care givers for normal and high risk newborns. The goal was to help improve observation skills and nursing interventions to improve care given to neonates and their parents. A 35-hour course offered three times in 1978-79 was planned and participated in by Doris Barker, R.N., M.S.; Eunice Mesler, R.N., Ed.D.; Bonita Schulze, R.N., M.S.; Carol Shanik, R.N., M.S.; Penelope Buschman, R.N., M.S.; Louise Warrick, R.N., M.S.; Catherine Muttart, Staff Associate, Pediatrics.

"Comprehensive Nursing—Making it Work for the Consumer" aimed to assist health care providers in planning, providing, and evaluating comprehensive long term care; to present both the consumer's and the provider's point of view; and to provide insight into the best utilization of community resources for optimal care of clients. This program was planned and participated in by Pamela HoSang, R.N., M.Ed.; Elsa Poslusny, R.N., M.A.; Elizabeth Carter, R.N., M.S.; Marilyn Jaffe, R.N., M.Ed.

"Human Sexuality: The Health Provider and The Client" was designed for health professionals in order to heighten awareness of the sexuality of clients. It provided information regarding special

needs of selected groups of clients and the effects of attitudes of the health care providers. Faculty who developed and participated in this program were Jeanne Brossart, R.N., M.Ed.; Phyllis Lisanti, R.N., M.S. Dr. John O'Connor, Associate Clinical Professor of Psychiatry, and Mary Romano, social worker, Presbyterian Hospital, also participated.

Visiting Professor

The School was fortunate to have been able to nominate and have appointed a Rudin Visiting Professor. Dr. Rozella Schlotfeldt from the nursing faculty and immediate past dean of the School of Nursing at Case Western Reserve was here during the week of March nineteenth. She met with faculty and students, and addressed a general health sciences audience on the topic, "Health Care of the Future." Dr. Schlotfeldt stimulated thought and was most generous in her willingness to consult on matters of concern to faculty and students. She met with the committee studying the future of nursing at Columbia.

Recruitment and Admissions

Recruitment efforts were directed primarily toward attracting freshman applicants, as has been true for a number of years. In January the applications were of the usual number but seemed of higher quality overall, suggesting that more might be accepted. By May, the number had dropped. The problems seem to be cost, the New York City location, and the need to have selected a major before entering college.

Other recruitment activities sought to publicize the graduate program and the nine tracks or "majors." A trip through several southeastern states included visits to nine colleges to encourage graduate study and specialization in nursing at Columbia.

Representatives of all of the Health Sciences Schools attended a career program at Williams College, planned by Elin Ozdemir, Director of Admissions of the School of Nursing, and as a panel presented the University's offerings in the health fields. This was very well received and will be offered again next year at Williams and perhaps elsewhere.

Degrees Conferred

Baccalaureate	130
Masters	Total: 28
Adult Nurse Practitioner	1
Pediatric Nurse Practitioner	5
Maternity Nursing—	
Nurse Midwifery	14
Perinatal Nursing	1
Psychiatric-Community Mental	
Health Nursing (Adult)	5
(Child)	2

Awards

The following awards were made during the year on the recommendation of the Awards Committee, chaired by Lucy Warren, R.N., M.Ed. The Rose Driscoll Award was presented to Michelle Petruzelli and the Catherine Chesney Award to Sheila Smyth in the Fall. At commencement in May, the Arlene Myers Award was given to Virginia Jackson, the Margaret Eliot Prize to Danielle Owen, the Jackson Prize to Rebecca Mull, and the Sister Joseph Ignatius Prize to Diane Jackson. The Alpha Zeta Chapter of Sigma Theta Tau awards were made to graduating students, Cynthia Dickinson, Julie Johnson, and Sheila Smyth. An additional award was made to a graduate student at Teachers College which is a part of the chapter at the School of Nursing.

Student Activities

Resident students on the Morningside Campus continued to be housed in Eli White and were joined by approximately fifty students from Columbia College and fifty from Barnard. The multi-school group made activities varied and interesting. Each group sponsored events, and as the year progressed, they worked together in planning. There were many combined activities of residents of Eli White and those in the Columbia College residence halls.

Maxwell Hall housing was shared with students from a number of different schools on the Health Sciences Campus. The variety of interests represented by the diversity of student groups enhanced the ambiance and the participation in events.

Modern dance, senior lifesaving, a film series, were among the interest groups active during the year. A weekly "Rathskellar" was popular and attracted residents of Bard Hall. Shared activities with the P&S Club, including several musical and dramatic programs, were participated in by a number of students.

An extensive career library, including announcements of position openings across the country, was maintained by the Student Affairs staff. The Student Government Association joined the staff in developing career day forums describing directions for practice and advanced education. This was supplemented by a lecture series focussing on specific specialties of expressed interest.

Political activity was generated by the national campaign to save the Nurse Training Act. The Student Association chartered a bus to Washington, D.C., for discussion with congressmen and observation of proceedings in Congress. The experience was seen by the students as very positive, and they believed they had a meaningful impact. The Associa-

tion also sponsored forums related to health care in New York State and New York City with elected officials participating.

Students served on a number of student/faculty task forces as well as the regular faculty committees to which they are elected. A town meeting exchange for faculty and students was sponsored.

Student participation on the Board of Governors of the Student Health Service was quite extensive and was well received. Innovations in space allocation, scheduling, and service were addressed, with improvement resulting in each.

A student Advisory Committee to the Associate Dean was established to provide a formal channel for the interchange of ideas and discussion of issues. The group will meet once or twice a semester and at the request of either group.

In Memoriam

It is with great sadness that the death of the immediate past Associate Dean of the School, Mary I. Crawford, R.N., Ed.D., is noted. A memorial service was held in the Presbyterian Hospital Chapel. Dr. Crawford's family, friends, hospital staff, and faculty joined in paying tribute to her. Dr. Felix Demartini, President of the Presbyterian Hospital, and Helen Pettit, Associate Dean (Nursing), Columbia University, spoke of some of the many contributions Dr. Crawford made to the Hospital, the School, and nursing nationally.

At Dr. Crawford's request, a fund has been established in the University for research in nursing. Contributions to the Mary I. Crawford Memorial Gift for Research in Clinical Nursing have been made in her memory. The fund is to support the joint efforts of the School of Nursing and the Nursing Service of the Presbyterian Hospital in research in clinical nursing.

Faculty

In January, Martha Haber, ('49), was appointed Vice President for Nursing at the Presbyterian Hospital, returning to the Hospital after holding a similar appointment at the University Hospital of the University of California at San Francisco. She has been appointed a member of the faculty and will make a variety of contributions in precepting graduate students and teaching in the area of administration of nursing services.

Barbara Decker, R.N., M.A., an alumna of the undergraduate program, holding her master's degree from Teachers College, and a certificate in nurse midwifery from Downstate Medical Center, has been named director of the program in maternity nursing-nurse midwifery. She has been a member of the faculty since 1976.

Linda Russo, R.N., M.A., conducted a Cardiopulmonary Resuscitation Certification course for faculty.

Reorganization of the faculty structure was initiated on July first with establishment of the Division of Psychiatric Nursing, Ann Earle, R.N., Ed.D., Chairman; and the Division of Maternal-Child Health Nursing, Eunice Messler, R.N., Ed.D., Chairman. These and other modifications unite faculty by clinical preparation regardless of the level of student they teach. Loretta Verdisco, R.N., M.S., (Medical-Surgical); Ellen Batt, Ph.D., (Biological Sciences); and Charmaine Fitzig, R.N., M.S., (Community Health) continue as Area Coordinators for faculty teaching graduate and undergraduate students.

Elsa Poslusny, a faculty member in the Division of Psychiatric Nursing, received an Ed.D. degree from Teachers College in January.

Research efforts continued. Margaret Grey, R.N., M.S., continued her study of the effects of immediate education for the child newly diagnosed as having diabetes. Melanie Dreher, R.N., Ph.D., has continued her study of the use of marihuana as part of the culture in Jamaica. Eileen Quinlan, R.N., M.S., has begun a research project with a multidisciplinary group at Morningside House in relation to the effect of reality orientation remotivation groups on staff and patients. Brenda Salakka Zinamon, R.N., M.Ed., has submitted a research proposal to investigate the effects of preoperative teaching for open heart surgery patients.

Student research is expanding with considerable interest. Among the first proposals to be approved by the Institutional Review Board were studies in the following areas; "Growth and Development of Infants with Congenital Heart Disease," "Breastfeeding-Prenatal Education," "Responsivity of Blood Oxygen Tension to Therapeutic Touch in Premature Newborns."

A joint committee between the Nursing Service of the Presbyterian Hospital and the School of Nursing has been established to recommend policies and procedures to govern the use of funds from the Mary I. Crawford Memorial Fund. Another joint committee has been formed to review research proposals in nursing to be proposed to the Institutional Review Board. Dr. Eunice Messler is the representative of the School of Nursing on this Board.

Committee on the Future

In the fall of 1978 an Ad Hoc Committee on the Future of Nursing at Columbia was appointed by Vice President Marks at the request of the President

of the University, Dr. William McGill. Members of the Committee were: Drs. Henry Aranow (Medicine) and David B. Sprinson (Biochemistry); John Fiorillo, Assistant Vice President for the Health Sciences; and the following faculty from the School of Nursing: Mary R. Barone, R.N., M.Ed.; Constance P. Cleary, R.N., M.Ed.; Ann M. Earle, R.N., Ed.D.; Lucie S. Kelly, R.N., Ph.D.; Eunice C. Messler, R.N., Ed.D.; Helen F. Pettit, R.N., M.A., Chairman.

The Committee met almost weekly. Consultants included Barbara Stevens, Professor of Nursing Education and Director of Health Service, Science, and Education, Teachers College; Donna Diers, M.S., Dean, School of Nursing, Yale University; and Rozella Schlotfeldt, R.N., Ph.D., Professor of Nursing Case-Western Reserve School of Nursing; and others were helpful. Dr. Paul Marks, Vice President for Health Sciences, met with the group as they sought direction. A report was submitted in the Fall of 1979.

University Seminars

The new Seminar on Aging and Adult Human Development was established by Professor Abraham Monk of the School of Social Work. Eileen Quinlan, R.N., M.S., and Dean Pettit are members. Several faculty are active members of the Seminar on Death.

Other Activities

During the year two faculty members served as members and chairmen of three search committees recommending appointments on the Health Sciences Campus. Elizabeth Carter continued to represent the School on the Library Committee and Elizabeth Mahoney on the Joint Allied Health Council.

Dolores Jackson served on a doctoral dissertation committee for a candidate in the School of Public Health.

Dr. Ann Earle continued her consultation activities in Babies Hospital of the Presbyterian Hospital and the Psychiatric Institute. She serves on the Nursing Advisory Committee of the Institute.

Sigma Theta Tau

Highlights of the year's activities included the Third Annual Conference on Translating Research into Practice. The topic was "Touch," and the keynote speaker was Dr. Gertrud Ujhely. Three additional programs featured Dr. Margaret McClure, Donna Diers, and Dr. Marilyn Oberst. Sixty-five members were inducted into the Chapter and national organization. Four awards were given at graduation to undergraduate and graduate students who best exemplified the purposes of Sigma Theta Tau.

Nightingale Collection

Through the cooperative efforts of the Presbyterian Hospital and the University, the Nightingale Collection was moved to an appropriate setting with other special collections in the Long Library. This will make the valuable materials available to students, faculty, and research fellows who frequently request access to these materials.

Alumni Relations

A new alumni club was formed in Southern California. More than fifty alumni met for luncheon in Laguna Hills at the invitation of Elizabeth Gill ('37), Dean Emeritus of Nursing and Director of Nursing, Presbyterian Hospital. The event was planned by Florence Vanderbilt ('27), Florence Bouton ('33), and Jane T. Whistler ('35). Jane Euglar ('44) has agreed to serve as the first chairman.

Susan Maines Saydah has continued to chair the group around San Francisco. This group met again this year and is planning ahead.

The School worked with alumni in Princeton, New Jersey, in several ways. Alumni in the area were invited to join those from P&S in an all-day scientific and social program to further School-Alumni interest. Joyce Beebe, R.N., M.P.H., C.N.M., who directed the graduate program in nurse midwifery, was one participant in a continuing education program, "At the Beginning of Life." Another program on Nursing and Hospice Care was offered by the alumni group and had the participation of a faculty member, Elsa Poslusny, R.N., Ed.D. Several alumni in Princeton participated as members of the panels of which the faculty were a part. Mrs. Liska P. Wright ('53) and Mrs. Margaret R. Hastings ('54) assumed major responsibility for these events. Continuing clubs in Connecticut (Nutmeggers), Washington, D.C., and Philadelphia have maintained their interest and support of the School.

Memorabilia of the School are being reviewed by Dorothy Rogers ('25) and Grace Davidson ('42). They are setting up a filing system for much of the material, and they would appreciate the assistance of volunteers to complete a formidable task. Real gratitude is felt for the contribution these alumnae are making, by no means their first.

The P&S Alumni Association took the initiative to explore possible interrelationships of the several alumni groups on the Health Sciences Campus. Student life activities is one issue of common interest. School faculty and Janet Alley, president of the Columbia University-Presbyterian Hospital Alumnae Association, Inc., have been involved and are most

interested in advancing the effort.

Alumni in several parts of the country have committed themselves to assisting in recruitment. Their participation takes several forms, including interviewing applicants for whom distance prohibits an interview at the School. These efforts are most helpful.

Fund Raising

Friends of the School, alumni, parents, faculty, and students have continued to assist in raising scholarship monies through the annual Bridge Party Benefit. Mrs. George Barson has given more of herself than could be dreamt of in the leadership of the group. Mrs. Frank Stinchfield, Mrs. John Reardon, Mrs. Neils Low, Mrs. George Hennig, Mrs. Charles Neer, Mrs. Lawrence Bain, Miss Patricia Lybarger, Miss Janet Alley, Mrs. Milton Phillips, Mrs. John J. Reilly have continued as members of the Committee for many years. Special thanks are due them and others. This was the twenty-first year of this benefit, and approximately \$17,000 was raised.

Through Medi/Center I Fund, the School has raised \$1,300,000 towards its initial goal of \$2,500,000. Scholarship, a faculty chair, research, and space needs have all received some support, the most being contributed toward scholarships.

Community and Organizational Activities

Faculty participation is as follows: *Jean Brossart*, R.N., Ed.D., member of Board of Directors, St. Marks Clinic; *Barbara Decker*, R.N., M.A., C.N.M., member of Family Centered Maternity Care Committee, Stamford Hospital, Stamford, Connecticut; *Charmaine Fitzig*, R.N., M.S., M.P.H., Coordinator (shared), NBC Health Fair; member, Education Committee, Visiting Nurse Service of New York; *Jean Flynn*, R.N., M.A., M.Ed., member, Home School Association, Leonia, New Jersey; *Dolores Jackson*, R.N., M.A., site visitor with a multidisciplinary team for peer review of services at five hospitals with perinatal services on Long Island; *Nancy Jones*, R.N., M.S., consultant for Blue Cross and Blue Shield of Greater New York Hypertensive Screening Program; *Helen Pettit*, R.N., M.A., American Association of Colleges of Nursing; member, Nursing Committee of New York Heart Association; secretary, Council of Deans of Nursing of Senior Colleges and Universities of New York State; treasurer, Deans and Directors of Nursing of Greater New York; member, Executive Committee and Editorial Board, Foundation for Thanatology; member, Nursing Education Committee, Visiting Nurse Service of New York.

Elizabeth Carter, R.N., M.S., American Nurses Association, member of Executive Committee of Psychiatric Mental Health Nursing Practice Division, member of Evaluation Research Conference Task Force; New York State Nurses Association, Executive Committee of Psychiatric Nursing Practice Conference Group; *Ann Earle*, R.N., Ed.D., American Nurses Association Directors of the Psychiatric Mental Health Nursing Programs; *Nancy Kulb*, R.N., M.S., C.N.M., American College of Nurse-Midwives Convention Committee, National Chairman; *Eura Lennon*, R.N., M.S., Black Nurses' Association Executive Board; *Carol Shanik*, R.N., M.S., member of the Nurses' Study Group of the National Foundation March of Dimes Regional Office; *Ann Wittenborn*, R.N., M.S., C.N.M., member of Community Advisory Board, SUNY University Hospital, Stony Brook, New York.

Papers Presented

Joyce Beebe, R.N., M.P.H., C.N.M. "Ethics and Nurse-Midwifery Practice" at American College of Nurse-Midwives, annual convention, Miami, Florida; Elizabeth Carter, R.N., M.S. "Nurses and Clients in Long Term Care: Some Parallels" at Columbia University School of Nursing Continuing

Education Program; Martina Duperret, R.N., M.S.N. "Assessment of Newborn and the Post-Partum Woman" at Visiting Nurse Association, Bayonne, New Jersey; Ann Earle, R.N., Ed.D. "The Future of Nursing Education in the United States" at Psychiatric Institute, Washington, D.C.; Margaret Grey, R.N., M.S. "Psychosocial Aspects of Diabetes" at American Diabetic Association convention, Los Angeles; "The Nurse's Role in Comprehensive Care for Children with Diabetes" at first Connecticut program Symposium for Children with Diabetes; Nada Light, R.N., M.S. and Penelope Buschman, R.N., M.S. "Education of a Child Psychiatric Nurse" at Orthopsychiatric Association annual meeting; Eunice Messler, R.N., Ed.D. "Nursing Care of the Cardiac Patient" at Western and Upper Manhattan Perinatal Network nurses conference; Elsa Poslusny, R.N., M.A. "Nursing and Hospice Care" at Princeton, New Jersey, Alumni Group; "The Teacher and the Chronically and Terminally Ill Child" at Teachers College conference on Psychology of the Handicapped; Linda Russo, R.N., M.S. "If Your Child Has a Terminal Illness: A Guide to Parents" at Thanatology Symposium on The Child and Death, Columbia University; Loretta Verdisco, R.N., M.A. "Primary Nursing" at Perinatal Network, St. Vincent's Hospital, New York.

Publications

Beebe JE, Thompson HO: A Paradigm of Ethics for the Maternal Child Nurse. *Maternal Child Nursing*, Vol. 4, May/June 1979.

Jaffe M: Specialist in an Integrated Curriculum: An Odyssey. *Journal of Nursing Education*, June 1979.

Poslusny E: Nursing Interview. *Dialogues, The Dying and The Living*, eds. Kutscher and Kutscher, The Foundation of Thanatology, New York, March 1978.

Poslusny E: Leukemia Patient Looks at Dying. Video tape, 33mm color. Discussion guide and bibliography.

Nursing Service

MARTHA E. HABER

Vice President, Nursing

The members of the Department of Nursing Services were saddened by the death of Dr. Mary Crawford on April 1, 1979. Dr. Crawford had only recently retired from the position of Vice President for Nursing, a post which she held since 1977. Dr. Crawford had provided leadership to Nursing at Presbyterian Hospital and Columbia University School of Nursing for many years as the joint Director of Nursing/Dean. She was renowned for her contributions in the field of Maternity Nursing and made a singular contribution to the profession through the development of the Nurse Midwife Program in the School of Nursing, Columbia University.

1979 has been a year of assessment, planning and reorganization for the Nursing Services. The purpose of these activities has been to promote excellence in nursing care and efficiency in its delivery. Three key concepts have characterized the approach which has been undertaken; they are communication, unification and participation.

To begin to actualize the concepts, the various clinical units were linked at the top administrative nursing level to promote a more equitable distribution of responsibilities among the Associate Directors and a more cohesive nursing organization.

The broad goals of the organization were to develop clearly defined standards of performance for nurses, to commit resources to the support of decision making and accountability at the level of the nursing unit, to develop an organized central nursing administration in support of nursing practice, to develop role models of nursing practice for nursing students from a variety of educational programs, and to create

a context for collaboration between physicians and nurses and other patient care providers.

An Executive Nursing Council was formed as the policy making body of the Nursing Services. The Council was chaired by the Vice President for Nursing and by the year's end, the membership was as follows: Yvonne Trebilcock, Medical/Surgical Nursing including clinical specialities of Ophthalmology, Otolaryngology and Urology; Ruth Rayner, Nursing Services for Harkness Pavilion and Presbyterian Hospital 4th Floor; Jane McConville, Nursing Services of Babies Hospital and Sloane Hospital; Margaret Harrington, Nursing Services of the Neurological Institute and the New York Orthopaedic Hospital; Dorothy O'Sullivan, Ambulatory Care Nursing in the Vanderbilt Clinics; Catherine Boyer, Division of Education; Helen Henry, Senior Associate Director; and Margaret Willers, Business Manager for Nursing Services.

Staff Development resources were centralized under the direction of Catherine Boyer, Associate Director, Division of Education to provide a more consistent pattern of staff education and more cost-effective use of available resources.

In January 1979, a task force was convened with Catherine Boyer as chairperson to initiate the development of conceptual framework for Nursing Services. A review of existing position statements, search of the literature, and discussion of key points resulted in a workshop which was held at Arden House, Harriman, New York on April 8 and 9, 1979. Participants included representatives from the Nursing Service, Nursing Education and Hospital Admin-

istration with a focus on beliefs about nursing. Statements developed in the process of the workshop and the existing philosophy of the Department of Nursing Services formed the basis for a position on beliefs about nursing and descriptive material relating to the setting, the client and nursing practice at Presbyterian Hospital. The resulting document will be the conceptual framework from which objectives for the Department will be developed, implications for further restructuring of the Department will be drawn and programs of nursing care will evolve.

In April 1979, the Presbyterian Hospital engaged the services of the Management and Planning Services of the Hospital Association of New York State to determine nurse staffing levels and to establish a patient classification system. Factors affecting nurse staff time were analyzed. Nurse interviews were completed on all shifts for 67 inpatient units, all operating rooms and ambulatory care facilities and administrative nursing services. A report of findings which will be available in April 1980 will provide a data base for decision making with regard to future staffing patterns throughout the Hospital.

The "Nursing Pulse" was initiated in 1979 with the assistance of Catherine Boyer. Linda Pflugsten undertook the development of the newsletter which serves as a means of communication to the nursing staff concerning activities within the Department and issues which influence nursing practice. The "Pulse" also provides an opportunity to acknowledge the accomplishments of members of the nursing staff.

September saw a marked increase in activity pertaining to the Presbyterian Hospital Priority Projects. Nurses from all levels of the Department participated in the development of plans for areas of the Hospital slated for renovation. Concepts of nursing care and nursing care delivery served as the basis for much of the planning.

Forty-five students comprised the last class to be graduated from the School of Practical Nursing this year. Decreasing demand for admission to schools of practical nursing has been noted in the greater New York area. Because of insufficient applications, no students were admitted to the program this fall. However there has been a rise in enrollment for the Associate Degree program and students will be admitted to a second class in January 1980. Fifty-six students were graduated from the Associate Degree program in 1979.

Miss Bernice Derby, Associate Director for Obstetrical and Gynecological Nursing retired in November 1979.

Mrs. Edith Ankers Kelly, who led the development of the Edna McConnell Clark School, which

included both the Practical Nursing Program and the Associate Degree Program, resigned her position as Director in 1979 to take up residence in Florida with her husband.

Mr. David Markant resigned as Associate Director for Indirect Patient Care Services to assume a similar post in a hospital in New Jersey.

New Appointments

Dorothy O'Sullivan—Associate Director, Ambulatory Care Nursing

Jane McConville—Associate Director, Maternal and Child Nursing

Yvonne Trebilcock—Associate Director, Medical, Surgical, Eye Nursing

Ruth Rayner—Associate Director, PH 4 and Harkness Nursing Services

Margaret Harrington—Associate Director, Neurological and Orthopedic Services

Linda Pflugsten—Administrative Assistant, Nursing Personnel

Nancy Boccuzzi—Assistant Director, Maternity Nursing Service

Anne Logan-Winston—Senior Supervisor, Neurological Nursing

Christine D'Angelo—Senior Supervisor, Neurological Nursing

Carmen Johnson—Senior Supervisor-Evenings, Neurological Nursing

Martha Kaelin—Staffing Systems Project Manager

Joan Kney—Director, Edna McConnell Clark School of Nursing

Patricia Morrissey—Associate Director, Edna McConnell Clark School of Nursing

Community and Organizational Activities

Patricia Morrissey, Associate Director of the Associate Degree Program chaired a two hour clinical session at the NAPNES convention in Philadelphia in May 1979.

Patricia Herlihy, Clinical Specialist, Surgical Intensive Care was elected to the membership of the planning committee for Advanced Seminars for Nurses, New York Heart Association. Ms. Herlihy also served as moderator for "Cardiopulmonary Bypass: Evolution, Present and Future Perspective," sponsored by the New York Heart Association on December 5, 1979.

The nursing staff of Area A were presented a plaque from the Patrolmen's Benevolent Association of the City of New York on October 9, 1979 in recognition of saving a patrolman's life.

Eileen Farrell, V.C. Senior Supervisor, conducted four sessions on the nursing aspects of Rape Advo-

cate Training. She also conducted a Staff Exchange Program for Emergency Room Nurses from St. Luke's-Roosevelt Hospital.

Debra Fitzpatrick, Nurse Specialist for the G.I. Diagnostic Unit, participated in the 6th Annual Meeting of the Society of Gastrointestinal Assistants and the Regional SGA Educational Seminar sponsored by the New York Society of Gastrointestinal Endoscopy.

Ann Miller, V.C. Senior Supervisor, participated in a radio show broadcast on rape.

Catherine Boyer, Associate Director for the Division of Education was elected to the Board of Directors and Executive Committee of the New York Lung Association; she was also appointed to the Community Health Council of the Presbyterian Hospital. On May 2, 1979, Ms. Boyer conducted a one day workshop, "Using the Clinical Setting: Strategies for Learning—Strategies for Evaluation" for the New Jersey Association of Diploma Schools. She also served as a panel member at the meeting of the Southern New York League for Nursing held on June 20, 1979. The topic of discussion was "Nursing Service and Nursing Education—A Dialogue."

Carmela Grande, Supervisor of the BHOR, and Joan Lawson, Head Nurse, were delegates at the AORN Congress in March.

May McDonald, Assistant Director of the NIOR, developed a video tape (with Ethicon, Inc.) that demonstrates the set-up and use of the operating microscope. This tape was shown at the Congress of Neurosurgeons in Las Vegas this fall as well as various other meetings.

Marion Smith, Senior Supervisor, Oncology, presented a paper "Significance of Breast Self-Examination Demonstration" at a program entitled *Nursing Focus on Primary Breast Cancer* sponsored by the American Cancer Society and National Association for Practical Nurse Education and Services, Inc. She was elected a member of the Nurse Advisory Board of the American Cancer Society. In addition, Ms. Smith spoke to the Fort Washington Senior Citizen Group on the topic "What You Need to Know About Cancer" and to the Regional Perinatal Network on "Primary Nursing."

Caroline Camunas, Senior Supervisor, GCRC, served as a panel member and speaker at the National Convention of Research Nurses and Dieticians held in Oklahoma City.

Rita Ryan, Senior Supervisor, Transplant & Dialysis, gave a speech entitled "Pre and Post Operative Care of the Renal Transplant Patient" at the Regional Urology Workshop in Saddle Brook, New Jersey. She has been elected a member of the Nurse Advisory Board of End Stage Renal Disease Board

of Network 25 and was appointed representative from the Presbyterian Hospital to Coordinating Council of End Stage Renal Disease Network 25. Ms. Ryan presented a talk on "Pre and Post Op Transplant Care" to the Dialysis Nursing Staff of Holy Name Hospital.

Barbara Butler, Assistant Director, PH 4, acted as Observer-Consultant to Collaborative Practice Project at Downstate Medical Center.

Kathryn Rieper, Denise Hoffmeister, Rosa Williams and Suzanne Wehrmaker were certified by the American Association of Neurosurgical Nurses.

Kathleen Horgan, CNM, was a speaker at the 2nd Annual Convention of the Nursing Association of the American College of Obstetricians and Gynecologists in Chicago, Ill. Her topic was "The Pregnant Teenager." At a symposium sponsored by the March of Dimes of Southeast Massachusetts, Ms. Horgan presented a paper, "Educational Programs for High School Students on Parenthood." She also spoke to the Western and Upper Manhattan Regional Perinatal Network concerning "Implementing Family Centered Maternity Care."

Mildred Abbott, CNM, Kathleen Horgan and members of the Adolescent Health Team presented "The Young Parent Program" and the "Psychiatric Implications of Planning Programs for Sexually Active Teens" to the St. Luke's Hospital Health Center, Division of Child and Adolescent Psychiatry.

Mildred Abbott appeared on several radio and television programs including "Not For Women Only," "You—The Black Woman" and on radio station WBAI. Among the many presentations she made during 1979 are the following: New York State WIC Maternal Nutrition Symposium in New York City, "Caring for the Pregnant Teenager"; Planned Parenthood of New York City, "Teen Pregnancy and Parenting"; and three lectures on maternal and child health, normal labor and delivery and alternatives in childbirth services. Ms. Abbott also served as Guest Lecturer for the Columbia University School of Public Health, Family Planning and Maternal/Child Health Track.

Mildred Abbott, Kathleen Horgan and Elizabeth Graham, Social Service Supervisor of Sloane Hospital, were co-leaders of a training workshop for professionals and other personnel who worked with adolescent parents through a variety of agencies sponsored by the Federation of Protestant Welfare Agencies, Inc.

Mildred Abbott and Emily Glazer, the Director of Community Outreach, planned and participated in an ongoing in-service education program for the New York City Department of Health-Community Outreach, Lower West Side and Harlem Health Dis-

tricts. The purpose was to prepare outreach workers to identify pregnant women at risk and to encourage prenatal care.

Doris Barker, CNM, spoke on Urinary Tract Infections and Care of the Patient with Renal Disease as Guest Lecturer for the Columbia University School of Nursing's Graduate Midwifery Program. Ms. Barker co-spoke to the Regional Perinatal Network on a series of four topics: Abruptio—Placenta Previa, Hemorrhage, Dystocia and Fetal Heart Abnormality. She also spoke to the Network in February 1979 concerning Diabetes Management and Nursing Care. Ms. Abbott conducted Babies Hospital Teaching Rounds in November 1978, March and April 1979. Topics included Antepartum Identification and Care of the High Risk Mother and Intrapartum Management and Goals. At the spring conference of the Nurses Association of the College of Obstetricians and Gynecologists, Ms. Abbott spoke on Nursing Management of Preeclampsia and Eclampsia during the Intrapartum Period.

Ilia Ocasio, Parent Educator, spoke to the Senior Biology Class of the Bronx High School of Science on Preparation for Childbirth, the Role of the Nurse in the spring of 1979.

Penelope Buschman, Clinical Specialist in Child Psychiatric Nursing, made the following presentations: "Family Centered Caring—Candle Lighters Group," Visiting Nurse Service; "The Clinical Specialist in Child Psychiatric Nursing," The American Association of Psychiatric Services for Children; "Integration of Child Mental Health Concepts into Pediatric Nursing Practice," Downstate Medical Center Continuing Education; "The Emotional Needs of Children with Diabetes Mellitus," Juvenile Diabetes Foundation; "Working with Dying Children and Families," presented as part of lecture series to third year Columbia University Medical Students; "The Impact of Long Term Illness on the Child and Family," Visiting Nurse Service of New York; "The Impact of Liver Disease on the Child and His Family," The Children's Liver Foundation; "Cultural Implications for the Treatment of Children

and Families," presented to the Columbia University Graduate Students in Child Psychiatric Nursing; "The Child and His Response to Major Illness and Chronic Disease," Regional Urology Workshop.

The Foundation of Thanatology and Columbia University presented "The Child and Death" in January 1979. Penelope Buschman served on the Planning Committee and as Moderator; Jane McConville, Associate Director, Maternal Child Nursing, delivered the welcoming remarks; and Lee Horsman, Oncology Nurse Specialist, served as a panelist.

Jeanne Figueira, Head Nurse, BH 9N, presented "Teaching Self Catheterization" at the November 1979 meeting of the International Urology Sciences, Inc.

Patricia Lybarger, Clinical Specialist—Medical and Surgical Intensive Care Nursing made the following presentations: "The Stress Response—Women and Heart Disease," N.Y. Heart Association Cardiovascular Nursing Seminar; "Early Nutrition and the Development of Heart Disease," Columbia University Masters Program in Perinatal Nursing; and "Children with Heart Disease," Visiting Nurse Service of New York.

Patricia Lybarger and Lee Horsman served as guest lecturers presenting "Responses of Health Professionals to the Dying Patient and His Family" to students enrolled in a course on Death and Dying at Pace University.

Joan Dobbins, Staff Nurse, BH 12 ICU, and Paula Navigante, LPN, BH 12 ICU, presented "Case Study of Bronchopulmonary Dysplasia" to the Regional Perinatal Network in February 1979.

In October 1978, Kathryn Rosasco, Staff Nurse, BH 12 ICU, presented "Neonatal Ethical Issues from the Nurses' Perspective" to the Perinatal Network. Ms. Rosasco also spoke on "Implications of Touch in Neonatal Nursing Care" to the Sigma Theta Tau Nursing Research Conference at Columbia University.

At the meeting of the Medical Media Associates held in New York City, Donna Handelsman spoke on "Hyperbilirubinemia."

Publications

Abbott M: Straight Talk (a pamphlet for school agers about counseling, family planning and maternity care programs designed for their needs), distributed for the New York City Public Schools, 1979.

Boccuzzi N: Systematic Management of a Neonatal ICU, The American Journal of Maternal-Child Nursing, Nov/Dec 1978.

The Growth and Development of the Practicing Nurse, The American Journal of Maternal-Child Nursing, March/April 1979.

Head Nurse Growth, A Supervisor's Priority, The American Journal of Nursing, August 1979.

Dostal E and Elder L: Breast Cancer: Special Nursing Considerations, The Journal of Practical Nursing, April 1979, pp 16-18, 45.

Kaelin Schmidt M, and Beshore Bliss, J: Evaluating Newly Employed Nurses Skills, Nursing Outlook, May 1979, pp 334-337.

Luke B, Jonaitis MA and Visconti M: Malnutrition and Fetal Growth in the Obese Gestational Diabetic, American Journal of Clinic Nutrition, April 1979.

Luke B, Jonaitis MA and Visconti M: The Obese Diabetic Gravida: Influence of Weight Gain on Complications, *American Journal of Clinic Nutrition*, April 1979.

Luke B: *Maternal Nutrition*, Little Brown & Company, December 1979.

Lybarger P: Co-author with S. Pasternack, Chapter on Cardiovascular Disease in *Comprehensive Pediatric Nursing*, McGraw Hill, New York 1979.

Lybarger P: The Intensive Care Environment: Its Effect on the Child and Parents, *Issues in Comprehensive Pediatric Nursing*, October 1979.

Max Carolyn: An Approach to Patient Education, *Dialogue*, October 1979.

Sharkey P, with Pippingier CE: Use of Phenytoin in Epilepsy, *Nurses' Drug Alert*, June 1979.

Tenenbaum M Faith: Review of Joslin Diabetes Manual, *Journal of Community Health*, Vol 4, No. 4, Summer 1979, pg 333.

Wehrmaker S and Wintermute J: *Case Studies in Neurological Nursing*, Little Brown & Company, November 1978.

Obstetrics And Gynecology

RAYMOND L. VANDE WIELE

Rapleye Professor and Chairman • Director of Service

1979 brought with it the usual problems, not the least, financial problems, but nevertheless it was a gratifying year, marked by significant progress in our educational, clinical and research activities. Our long lasting efforts to bring in a full-time Director of Education became successful when Dr. R. Petrie accepted this challenging task. Dr. Solan Chao accepted the position of Director of the Obstetrical and Gynecological Service at the Harlem Hospital Center, thereby greatly strengthening the ties between our Department and the Harlem Service. Dr. Fox has succeeded Dr. Chao as Medical Director of the Perinatal Network.

There were other important clinical developments. The Perinatal Division was awarded a substantial grant by NIH to organize a Center for the Study of Fetal Hypoxia and Maternal Smoking. Similarly, our Service was designated as a Center for the Study of DES Progeny by New York State and as a Center for Prenatal Diagnosis by New York City.

As part of the Priorities Project of the Presbyterian Hospital, major changes are planned for the physical facilities of our Department. The out-patient clinic on the 4th floor of the Vanderbilt Clinic is in the process of being renovated, and we expect to move into the new quarters by the Spring of 1980. More fundamental has been the decision to move the clinical facilities of the Obstetrical and Gynecological Service to the 5th, 6th, 7th and 12th floors of the Babies Hospital shell; and to the 12th floor of the Presbyterian Hospital. It is expected that the relocation of the Obstetrical and Gynecological Service will be finished in 1981.

In December, the Department had a very successful weekend retreat at Arden House to discuss the participation of our department in the development of a Master Plan for the Columbia Presbyterian Medical Center.

The Center for Reproductive Sciences

This Center, functioning under the direction of Dr. Georgiana Jagiello, is composed of an interdisciplinary group of investigators from various academic departments in the College of Physicians and Surgeons whose bond is their common interest in the physiological and biochemical mechanisms underlying normal and abnormal human reproductive function. Beside having an important research role, the Center participates significantly in the teaching of graduate and postgraduate students.

A generous grant from the Mellon Foundation has enabled the Center to recruit new faculty and to extend its activities into new areas of research. The first investigator to join our staff as a result of this recruitment effort was Dr. James L. Roberts. His primary research interest lies in the regulation of pituitary peptide hormone gene expression. Using both nucleic acid protein chemical technologies, Dr. Roberts is studying the gene expression of pituitary peptide from the level of transcription to its secretion. A second investigator, Dr. Debra Wolgemuth, whose field of study is the biochemistry of the developing ovum, has just joined our Staff.

The activities of the Center can best be discussed under five headings:

Biochemistry of Reproduction

The laboratory of Reproduction biochemistry, under the direction of Dr. Seymour Lieberman, is presently engaged in three important and novel facets of steroid hormone biochemistry. One involves efforts to obtain evidence that would support the hypothesis that steroidogenic processes are catalyzed by multienzyme complexes which reside in hypothetical "hormonosomes" of the cells of steroid-producing tissues. This manner of considering steroid hormone biosynthesis is novel in that it proposes that the enzymatic processes involved in biosynthesis occur in a series of concerted reactions involving enzyme-bound intermediates which are ordinarily not released into the medium in free state. The second aspect concerns the nature and function of the naturally occurring lipoidal derivatives of steroids recently discovered by this laboratory. The discovery of these hitherto unsuspected non-polar derivatives of steroids opens an entirely new area of steroid hormone biochemistry. The third activity of the laboratory deals with an area of long-term controversy, the biosynthesis of estrogens by the placenta.

The work of the laboratory of Dr. Daniel Linkie continues to be focused on the mechanism of estrogen action with particular emphasis on the early events of hormone-receptor interaction. Specifically, the laboratory has studied the initial event of estrogen interaction with its receptor at the target cell level. Studies of estrogen and progesterone receptors in the endometrium have focused on possible age-related changes in the bioactivity of the specific receptor system and the intranuclear receptor-acceptor population. Collaborative studies with Drs. Feigelson (Roosevelt Hospital) and Dr. Hembree continue, as well as those with Dr. B. Lasley of the San Diego Zoo.

The laboratory of Dr. Muriel Feigelson at Roosevelt Hospital continues to devote its efforts to studies of the endocrine mechanisms regulating mammalian peri- and postnatal development. In collaboration with Dr. Linkie, Dr. Feigelson has been exploring peri-natal developmental events associated with the maturation of the mechanisms controlling tonic gonadotropin secretion. Their recent observations suggest that in the male, as well as in the female, the differentiation of the endocrine hypothalamus is critically dependent upon the effect of gonadal hormones.

Neuroendocrinology of Reproduction

The Neuroendocrine Group, composed of Drs. J. L. Antunes and B. Carmel (Neurosurgery); M. Ferin (Ob/Gyn and Physiology), and E. Zimmerman

(Neurology), has continued its research on the neuroendocrinology of reproductive processes in primates. One animal model used was the stalk-sectioned rhesus monkey and with L. Vaughan, P. Diefenback and A. Dennison (medical students), endocrine and anatomical studies of the model were completed. This model was also used to demonstrate that both negative and positive feedback effects of the ovarian steroids on gonadotropin secretion operate at the hypophyseal rather than at the hypothalamic level. Similarly, studies in collaboration with Dr. A. Frantz (Medicine) show that the stimulatory effect of estrogens on prolactin release operates at the same level. The technique for hypothalamo-hypophyseal blood collection perfected during the last years was used to demonstrate the modulation of LH releasing factors by ovarian steroids and, with Dr. S. Wardlaw (Medicine), to demonstrate the release of β -endorphins directly into the portal blood circulation. A study of the hormonal content and secretory activity of the *pars tuberalis*, an extension of the adenohypophysis, was completed. Another study dealt with the regenerative processes within the central nervous system following selective lesions of hypothalamic magnocellular pathways. Work being completed with Dr. P. Cogen and K. Louis (Neurosurgery), explores the effects of anterior hypothalamic disconnection on menstrual cyclicity. With Drs. W. Werhenberg and I. Dyrenfurth, a study of photoperiodic control of gonadotropin secretion in the female rhesus monkey has been initiated. With Dr. M. Eckstein (Visiting Research Fellow), the effects of substance P on anterior pituitary secretion have been investigated. A collaborative study with Dr. E. Knobil (University of Pittsburgh) has led to the important demonstration that pituitary activation in terms of gonadotropin secretion can only be obtained by a pulsatile input of GnRH. The frequency of these pulses determine not only the magnitude of the FSH/LH release but also the relative secretion of FSH and LH.

Dr. Dominique Toran-Allerand is continuing her studies on the organizational role of the gonadal steroid hormones and of α -fetoprotein on the development of the mammalian brain, using long-term organotypic cultures of the fetal and neonatal rodent brain. Some of her studies are in collaboration with investigators at the Rockefeller University, Yale University, McGill University and the University of Illinois. In collaboration with Dr. James Roberts, Beth Schachter and Mr. James Eberwine (Biochemistry), Dr. Allerand is studying the intraneuronal biosynthesis of α -fetoprotein by means of cDNA probes for the mRNA for α -fetoprotein.

Female Reproductive Endocrinology

Drs. R. Jewelewicz and R. L. Vande Wiele continue their studies on the effects of Bromocriptin on patients with amenorrhea-galactorrhea with specific emphasis on the effect of pregnancy on patients with pituitary tumors. A study on the effect of Bromocriptin on the ovarian response to human menopausal gonadotropins and Clomiphene citrate has been initiated. Dr. Jewelewicz, M. Schwartz, M. Yeh and Vande Wiele are using Ultrasonographic techniques to follow ovarian size and follicular development in patients undergoing treatments to induce ovulation. This approach may become an important new method for the clinical evaluation of such patients.

Male Reproductive Endocrinology

During the past year, Dr. Wylie Hembree and co-workers have continued studies of 1) marihuana effects upon spermatogenesis and sperm function, 2) endocrine and germ cell changes associated with the development of and recovery from Vitamin A deficiency in male rats, 3) the association of structural and/or numerical chromosomal abnormalities in human clinical infertility, 4) a therapeutic evaluation of testosterone rebound in the treatment of male infertility, 5) the biochemical abnormalities associated with male reproductive dysfunction and 6) the metabolism of tritiated gonadotropin releasing hormone.

Dr. Harold Calvin has continued his studies on the role of trace elements such as zinc and selenium in the development of keratin-like sperm tail structures. The localization of the major sperm selenoprotein in the outer mitochondrial membrane has been established firmly and preliminary autoradiographic evidence, obtained in collaboration with Dr. Edith Wallace, suggests that the introduction of selenium into this protein may occur as a posttranslational event at about stage 10 of mouse spermiogenesis. Ultrastructural and biochemical analysis of zinc and selenium-deficient mouse and rat testes and sperm are in progress.

Genetics of Reproduction

The laboratories of Dr. G. Jagiello continue to work in the overlapping disciplines of reproductive endocrinology and meiotic development of mammalian germ cells. Emphasis this year has been on diplo-tene analysis of chiasmata with age in mammals, further studies on the internalization of luteinizing hormones in oocytes and their mode of action, the completion of pachytene maps of the female mouse and human male and female germ cells, and quantitation of gene amplification in the human oocyte.

Division of Perinatal Medicine

As in previous years, the Perinatal Division under the direction of Dr. L. Stanley James has continued to coordinate the perinatal activities of the Departments of Obstetrics and Gynecology, Pediatrics, and Anesthesiology. Through a close collaboration with the Regional Perinatal Network, the Perinatal Division has extended its influence over most of Western Manhattan, Rockland and Westchester counties, parts of New Jersey, and southern Connecticut.

Significant progress has been made in several aspects of patient care. Through acquisition of additional hardware, we have come close to our goal of having on-line computer programs available for clinical monitoring on a 24-hour, 7 day per week basis. New programs for intrauterine growth and intrapartum risk assessment are being developed by Mr. Henry Rey in collaboration with Drs. Harold Fox and Ming-Neng Yeh. In addition to currently available software, these new programs should greatly facilitate patient management through extensive and comprehensive data reduction and also in the development of predictive models.

The incidence of immature births (less than 2500 gms.) has now risen to nearly 15% of all deliveries. This rise, which to a significant extent reflects increased referrals resulting from the activities of the Regional Perinatal Network, has halted further decreases in our total perinatal mortality. The survival rates of these small infants, however, continues to improve. An important factor in this improvement has been our recent policy for cesarean section deliveries in the weight group below 2000 gms.

The Diagnostic Obstetrical and Gynecological Ultrasound Laboratory, under Dr. M. Yeh, operates now as an independent unit within the Department. Equipment and personnel have been significantly increased to accommodate the rapidly rising patient load.

The Perinatal Division continues to operate its successful teaching program. In addition to a training program for physicians seeking subspecialty training in Perinatal Medicine, the Division conducts a series of courses and training activities for students and residents of the affiliated hospitals, as well as for institutions that are part of the Regional Perinatal Network.

The research activities of the Perinatal Division have been greatly expanded over the last year. The Division has been successful in an application to NIH for support of a Center for the Study of Fetal Hypoxia. Dr. Fox, in collaboration with Drs. Yeh, Zena Stein, and Laxmi Baxi, are defining the characteristics of fetal breathing and fetal heart patterns in uncomplicated pregnancies, as well as in heavy

smokers and patients with significant hypertension. They are also determining whether patterns of fetal breathing and fetal heart rate change with gestational age and whether these patterns are related to fetal hypoxia. In collaboration with Dr. William Blanc and Dr. A Moessinger, the placental structure and composition associated with smoking during pregnancy is being characterized.

Studies of fetal neuroendocrinology are conducted in collaboration with Dr. Vande Wiele and Dr. Frantz (Medicine). These experiments explore the activation of the hypothalamic-neurohypophyseal axis in the fetus as a function of gestational age and of acute and chronic stress. The chronically catheterized fetal lamb and baboon models have been used to elucidate the physiology and pathology of the neurohypophyseal response in stress. In the human fetus, blood levels of β -endorphin, vasopressin and ACTH have been measured as possible markers of stress.

Dr. Raymond Stark, in collaboration with Dr. Thomas Blumenfeld, has studied the fluorescent polarization technique for the prediction of the respiratory distress syndrome. Their studies have shown that the fluorescent polarization technique has diagnostic as well as technical advantages over the determination of the L/S Ratio, the most frequently performed test for fetal lung maturity.

Dr. Phyllis Leppert and Dr. Ines Mandl are collaborating in a study of the role of the connective tissue of the uterine cervix in the initiation of labor.

Dr. Laxmi Baxi has continued her studies of the fetal PO_2 during labor. She has shown that following paracervical block there is a significant decline in oxygen tension, indicating that the fetal heart rate change in this situation may be secondary to fetal hypoxia.

Dr. Petrie has continued his studies of the effects of drugs on the intrapartum fetus and upon uterine activity. Work is underway on the evaluation of antepartum fetal heart rate and the monitoring of the fetus in various maternal and fetal categories. The evaluation of the management of the very low birth weight infant is nearing completion.

Dr. Mandl and her associates have continued their investigation of the fetal development of pulmonary elastin and the precise role of elastin immaturity in the predisposition to respiratory distress syndrome. Other experiments in her laboratory, in collaboration with investigators in the Department of Medicine, are designed to get an insight into pulmonary connective tissue composition during development and aging.

The anesthesiology section of the Perinatal Division continued to operate this year under the direction of Dr. M. Finster, Dr. H. Pederson, with Drs. Fins-

ter and Matteo, has continued her studies of placental transfer of drugs used during obstetrical anesthesia. In collaboration with Mr. Rey, Drs. Finster and Pederson have examined the possible correlation between the antepartum duration of anesthesia and fetal outcome.

Genetics

Our Genetic Counseling Service has joined similar services in other departments to organize a Center for Clinical Genetics at the Columbia-Presbyterian Medical Center. This amalgamation of heretofore independent activities should greatly strengthen the teaching of Clinical Genetics and care of patients with genetic problems.

Several studies in the field of Human Genetics and Development are discussed in the report of the Center for Reproductive Sciences. The laboratory of Dr. Orlando J. Miller, in collaboration with Dr. Steven J. Wachtel and Dr. Gloria Koo (Memorial-Sloan Kettering Cancer Center), is continuing its investigations of the H-Y antigen in sex differentiation. Dr. Miller and his associates, in collaboration with Dr. Carlo Croce (Wistar Institute, Philadelphia) and Dr. Martin Rechsteiner (University of Utah), are continuing to use human-rodent somatic cell hybrids to study the genetic regulation of ribosomal RNA synthesis.

Obstetrical and Gynecological Pathology

This Division, under the Directorship of Dr. Ralph M. Richart, has continued its active program of teaching gross and microscopic diagnosis to both Pathology and Obstetrics and Gynecology residents. The Division's interest in gynecological neoplasia has continued. Studies of cervical intraepithelial neoplasia in diethylstilbestrol-exposed female progeny, and the natural history of the vaginal and cervical changes which are found in DES-exposed girls and women, have been studied in collaboration with Dr. R. Levine. The Division has also continued its interest in the development of an out-patient technique for female sterilization in collaboration with Dr. Robert Neuwirth. Clinical trials of the tissue adhesive methylcyanoacrylate, which will produce tubal closure, and a delivery system, the FEMCEPT device, are underway in a number of collaborating centers in the Far East, Europe, and Central America. These early trials have been promising and larger scale trials are planned for the coming year.

Neoplastic Disease

Dr. Edgardo Yordan has joined the division of Obstetrical and Gynecological Oncology. His first

task will be to coordinate the activities of the oncological divisions of the affiliated hospitals into a regional network, following the pattern that has been so successful for the Perinatal Network. In addition to the studies carried out by the Division of Obstetrical and Gynecological Pathology, several other studies relating to neoplastic disease are being carried out.

Dr. Barron has continued his research on mathematical models of gynecological cancer.

Dr. Cecilia Fenoglio has continued her collaborative studies on the relationship between neoplasia and latency with respect to herpesvirus. Together with Dr. MacDougall at the Fred Hutchinson Cancer Center, Dr. Fenoglio has carried out studies aimed at the detection of herpes-specific messenger RNA and herpes-specific antigens in reproductive tissue as well as in ganglia and peripheral nerves. Collaborators in these studies are Dr. R. Levine, Dr. Chris Crum (Pathology), Dr. D. Townsend (Los Angeles), Dr. R. Richart and Dr. Purifoy, (Leeds, England). Dr. Levine has continued his work in the colposcopy clinic in which patients with preinvasive forms of cervical neoplasia are evaluated and treated. The clinic activities have been expanded to include patients with vulvar and vaginal neoplasia and also those exposed to DES *in utero*. Laser therapy has recently been added as a treatment modality and has several advantages over more conventional therapy.

Dr. H. C. Frick, II, Dr. R. McCaffrey and Dr. G. Hyman (Medicine), are studying the effect of the

combination of cis-platinum and adriamycin chemotherapy on advanced gynecological cancer.

Division of Ambulatory Care

The Division of Ambulatory Care was created during the past year as a formal entity within the Department of Obstetrics and Gynecology and operates under the direction of Dr. Allan Rosenfield. Together with the Division of General Medicine and General Pediatrics, the Division of Ambulatory Care is involved in ongoing thorough reassessment of how ambulatory services are delivered within the Vanderbilt Clinic. Each of these three divisions have instituted private group practice models as a mechanism to improve the delivery of care of lower income, inner-city women.

Based on the success of the adolescent fertility—family related program of the Division and of the Center for Population and Family Health, priority attention for the coming year will be given to the development of a comprehensive adolescent program in conjunction with an adolescent unit recently established by the Pediatrics Department; as well as with other departments, including Psychiatry, Medicine and Dentistry.

Family planning related programs operated by the Division are discussed in the report of the International Institute for the Study of Human Reproduction.

TABLE 1
CLINIC VISITS

	1974	1975	1976	1977	1978	1979
Obstetrical	25,952	23,195	22,119	25,488	24,362	12,524
Gynecological	10,000	9,800	9,044	9,286	8,424	18,003
Sloane Screening						8,043
TOTAL	35,952	32,995	31,163	34,774	32,786	38,570

TABLE 2
DELIVERIES

	1966-1975 Average	1976	1977	1978	1979
Ward	2,460	1,433	1,789	1,657	1,736
Semi-Private & Private	1,219	1,101	1,328	1,313	1,361
TOTAL	3,679	2,534	3,117	2,970	3,097

TABLE 2a
OPERATIVE DELIVERIES — 1979

	Ward	Private & Semi-Private	Total
Caesarean Sections	345 (19.9)	400 (29.4)	745 (24.1)
Primary	218 (12.6)	264 (19.4)	482 (15.6)
Repeat	127 (7.3)	136 (10.0)	263 (8.5)
Mid Forceps	55	44	99 (3.2)
Low Forceps	224	147	371 (12.0)
Breech Deliveries	29	19	48
Vacuum Extraction	6	4	10 (0.3)

TABLE 3
PERINATAL MORBIDITY

	1966-1975 Average	1976	1977	1978	1979
Ward	20.2/M	14.8/M	11.2/M	8.5/M	9.9/M
Private and Semi-Private	20.7/M	13.6/M	7.5/M	15.2/M	12.5/M

M = per thousand viable births (more than 1,000 grams)

TABLE 4
STILLBIRTHS AND NEONATAL DEATHS

	1966-1975	1976	1977	1978	1979
Stillbirths	10.6/M	8.3/M	5.8/M	6.0/M	5.8/M
Neonatal Deaths	9.8/M	6.0/M	3.9/M	5.4/M	5.2/M
TOTAL*	20.3/M	14.3/M	9.6/M	11.4/M	11.0/M

*Total values rounded to nearest decimal place.

TABLE 5
RELATION OF BIRTH WEIGHT TO PERINATAL MORTALITY

	Total Births	Total Perinatal Deaths	1979 Per Cent Perinatal Mortality
500 — 999	50	32	64.0
1,000 — 1,499	41	13	31.7
1,500 — 1,999	59	6	10.2
2,000 — 2,499	193	5	2.6
Over 2,500	2,788	10	0.4
TOTAL	3,131	66	2.1

TABLE 6
GYNECOLOGIC OPERATIONS

	1966-1975	1976	1977	1978	1979
Ward	648	451	444	585	691
Semi-Private	533	522	516	739	{ 1299
Private	527	549	669	690	
TOTAL	1708	1522	1629	2014	1990

TABLE 7
SHORT STAY SURGICAL UNIT

PROCEDURE	PRIVATE	WARD	TOTAL
Diagnostic D&C	205	8	213
Incomplete Abortion	40	25	65
Missed Abortion	7	4	11
Inevitable Abortion	0	0	—
Threatened Abortion	1	0	1
Induced Abortion	326	464	790
Induced Abortion with			
Laparoscopic Tubal Ligation	16	0	16
Laparoscopic Tubal Ligation Only	80	75	155
Diagnostic Laparoscopy	116	0	116
Diagnostic Hysteroscopy	2	0	2
Laparoscopy/Hysteroscopy	22	0	22
Laparotomy	2 (1 with AB)	0	2
Other	23	1	24
	840	577	1417

TABLE 8
CASES OF GYNECOLOGIC CANCER TREATED OR UNDER OBSERVATION
DURING EACH OF YEARS FROM 1957—1979

	TOTAL PATIENTS FOLLOWED	THE PRESBYTERIAN WARD	PRIVATE	FRANCIS DELAFIELD
1957	1,950	850	696	404
1958	1,883	853	612	418
1959	1,945	920	618	407
1960	2,248	1,084	696	468
1961	2,384	1,180	732	472
1962	2,601	1,319	801	481
1963	2,851	1,527	783	541
1964	3,198	2,752	852	594
1965	3,633	2,015	930	688
1966	3,581	2,282	850	449
1967	3,577	2,301	901	375
1968	2,396	1,281	742	373
1969	2,110	1,045	817	248
1970	2,003	966	752	285
1971	2,169	1,095	779	295
1972	1,996	966	780	250
1973	2,040	985	805	250
1974	2,042	1,013	779	250
1975	2,021	1,158	863	***
1976	1,902	1,106	796	***
1977	1,853	1,028	825	***
1978	1,870	1,004	866	***
1979	1,770	947	823	***

***Francis Delafield Hospital Closed July 30, 1975

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Ophthalmology

CHARLES J. CAMPBELL

Edward S. Harkness Professor and Chairman • Director of Service

Teaching

The teaching activities of the Department of Ophthalmology are varied and encompass a broad scope. Attention is directed not only to the clinical aspects of ophthalmology but to the basic science disciplines relevant to ophthalmology. There is also a substantial variation in the pedagogical techniques employed ranging from tutorial sessions in a bedside environment to formal lectures and seminars. The students' requirements are of primary importance in fashioning the most appropriate program.

Medical student teaching (Dr. Srinivasan) consists of the major medical year and a clinical elective program. A new combined clinical and basic research elective program was initiated last year for students who have a primary interest in pursuing a career in academic ophthalmology. A purely clinical elective is offered and there is an elective in basic research (Dr. Balazs). There has been a further expansion and refinement of the Basic Science Course (Dr. Hoefle) designed to provide intensive instruction for beginning resident physicians. Postdoctoral training in specific basic sciences is available and continues to be an active program (Dr. Balazs). Fellowship training (Dr. Forbes) has been substantially strengthened and developed in the various subspecialties of clinical ophthalmology. This program involves the Columbia affiliated hospitals and integrates the clinical fellow into the Basic Research Division. The program of continuing education for practicing ophthalmologists (Dr. Farris) has been further expanded and is proving to be increasingly popular as greater emphasis is

placed on this area and recertification. Ophthalmic assistants are essential for the effective and efficient practice of clinical ophthalmology and an active training program has been developed (Ms. Moore).

All clinical and scientific staff members are active participants in local, national, and international societies relevant to ophthalmology. They function as officers in these organizations, serve in important administrative and teaching capacities, and represent the Department most effectively in the academic world. Many are concerned and active in philanthropic groups interested in ophthalmology and are associated with the editorial boards of scientific publications.

Research

The research activities of this department encompass a broad range involving virtually every aspect of clinical and basic ophthalmology. The department structure consists of seven laboratories for basic studies and fifteen subspecialty clinics for clinical research. Many projects involve significant interaction between clinicians and basic scientists.

New instrumentation often represents major advances and in ophthalmology permits refined diagnosis and improved therapy. A wide field specular microscope has been designed and constructed, and initial testing of a clinical prototype is in process (Drs. C. J. Koester, A. Donn, F. B. Hoefle, C. Roberts). This new microscope permits study of areas of the corneal endothelium *in vivo* which are at least ten times larger than were possible with previous

instruments. Consequently, orientation is preserved and more quantitative assessments of the status of the endothelium are possible. An important study already in progress deals with the healing of wounds in the endothelial cell layer of rabbit and cat corneas. Time lapse photography of wound healing *in vivo* is now possible for the first time (Dr. Roberts).

Another area of intense activity employs a 50 watt carbon dioxide laser system causing vaporization of tumors both externally and intraocularly. The histopathologic response of ocular tissues to carbon dioxide laser radiation is presently being studied. An animal model with an intraocular tumor also will be investigated (Drs. F. S. L'Esperance, W. A. James, Jr.). An improved submillimeter resolution CT scanner is now available and is being applied to the problems of diagnosis of ophthalmologic disease. The higher resolution has lead to an increased specificity with characteristic tissue patterns for various specific lesions. An analysis of the CT pathophysiology of orbital inflammatory disease is leading to improved and more specific CT findings which virtually eliminate the term pseudotumor (Drs. S. L. Trokel, S. K. Hilal).

The Institute has long been a center for ocular oncology. The manifestations of sellar and parasellar tumors have been reviewed (Dr. M. M. Behrens). Lacrimal sac tumors have been the subject of a detailed investigation (Drs. G. M. Howard, J. Lemoine), and cystic orbital tumors and orbital tumors in children also have received attention in this past year (Dr. Howard).

Infection and inflammation have long posed a threat to the structure of the eye and its function, particularly when the pathology is located intraocularly. Detailed studies of virus, chlamydial, and fungus infections are continuing with the goal of evolving specific proposals for effective management (Dr. R. W. Darrell). In association with the Pediatric Rheumatology Department, an experimental drug for the management of juvenile rheumatoid arthritis is under investigation; this disease is of particular importance in ophthalmology since the ocular complications often lead to loss of vision and even blindness (Dr. H. F. Spalter). The anti-inflammatory aspects of corneal wound healing and the factors that control the chemotaxis and polymorphonuclear leukocytes are receiving further attention (Drs. B. D. Srinivasan, P. S. Kulkarni). Degenerative disorders, particularly of the retina, constitute another grave threat to vision in an aging population. The notion has been proposed speculatively that some degenerations may be the result of inflammation. Highly limited low grade inflammatory insult to the endothelial cells of the vessels may cause secondary vascular defects leading to some degenerative syndromes. This is

being explored both clinically and experimentally (Dr. E. Wirostko).

The optical correction of aphakia has been one of the great challenges to ophthalmology; spectacles, contact lenses, and intraocular lenses have all been employed with varying degrees of success. Recent advances in contact lens technology have resulted in materials that are well tolerated, and contact lenses manufactured from these substances can be worn for extended periods of time. Evaluations of the Perilens and the silicone contact lens for extended wear are in progress (Drs. J. W. Espy, F. B. Hoefle). Aphakia resulting from trauma, especially in young people, often results in loss of binocular vision. The techniques of management and the results obtained have been reported (S. Moore).

Cataract and glaucoma continue to represent major threats to vision, and long term clinical study is underway for the most effective management of these two problems, especially when they are combined (Dr. A. de Roeth). Limited clinical investigations have been conducted on the value of marijuana for control of elevated intraocular pressure. It has been concluded that marijuana has no role in the therapy of glaucoma (Dr. de Roeth). The role of the anesthetic agent Ketamine in diagnosis and to facilitate surgical decisions in the management of primary infantile glaucoma is being explored (Dr. M. Forbes). The mechanics of the opened globe are being considered in an effort to minimize the positive pressure phenomenon during intraocular surgery, thereby reducing complications (Dr. Forbes). Another study has employed hyaluronic acid in an attempt to reduce complications in anterior segment surgery; the substance is well tolerated and it appears to have great promise not only in glaucoma surgery but in pseudophakia (Drs. L. Pape, E. Balazs).

Vitreous hemorrhages can cause complete loss of vision; the problem is ominous if the hemorrhages are recurrent and especially if they are associated with uveitis and glaucoma. The management of vitreous hemorrhages can be difficult and their surgical care and prevention is receiving attention (Dr. C. Campbell). Diabetic retinopathy is one of the major causes of vitreous hemorrhages and in itself is the major cause of blindness in patients in the middle age category. A number of different laser techniques are being employed in an effort to determine the most effective therapy for diabetic retinopathy (Drs. Campbell, L'Esperance, Spalter).

The Matrix Biology Laboratory continued its work on the biological effects of hyaluronic acid, studying the regulatory role of this extracellular polysaccharide on the phagocytosis of macrophages and granulocytes (Drs. Balazs, J. Sebag, M. Paul). The chemical and physical structure of hyaluronic acid

was the subject of intensive investigation (Drs. Balazs, K. Meyer, M. Cowman, D. Wedlock, Ms. S. Briller). The primary structure of a polysaccharide prepared from fish eyes and called ichthyosan was further elucidated (Drs. Balazs, G. Armand). The metabolism and age-dependence of the hyaluronic acid in rabbit joints and rhesus monkey vitreous was investigated (Ms. J. Denlinger, Drs. Balazs, G. Eisner). The first comprehensive biochemical and microscopic studies on human vitreous were completed (Drs. M. Flood, Balazs, Sebag). A fractionation method for various sizes of hyaluronic acid molecules was developed and used for characterization of this macromolecule in arthritic synovial fluids (Ms. Briller, Dr. Balazs). In a pioneering study a highly purified viscous fraction of Na-hyaluronate was used as a surgical aid (viscosurgery) in human cataract and glaucoma surgery (Drs. Pape, Balazs). The therapeutic role of this same Na-hyaluronate fraction in prevention of adhesions and scar tissue formation was also investigated (Ms. Denlinger, Drs. Balazs, R. St. Onge, C. Weiss).

The Biochemistry and Molecular Biology Laboratory continued its major effort to elucidate the chemical events which occur in human cataract formation. These observations have led to the conclusion that a very early change in lens chemistry that leads to cataract in older individuals is caused by oxidative insult to the lens cell membrane. (Drs. W.H. Garner, A. Spector). It was shown that an extrinsic membrane component acts as an enucleation site for this aggregation, reflecting the fact that oxidation appears to occur first at the membrane (Drs. Spector, M.H. Garner, W.H. Garner, D. Roy). The work represents a collaborative effort with the College of Medicine and Dentistry of New Jersey (Drs. P. Farnsworth, S. Shyne). Continuation studies on the state of the sulfhydryl group of normal and cataractous lenses indicates essentially little or no oxidation in the normal lens proteins but dramatic increases in this parameter in cataract (Drs. E. Anderson, D. Wright, A. Spector). A study has now been completed showing the change in the concentration of the major polypeptides of the lens in the water soluble and water insoluble fractions in cataractous human lens (Drs. Garner, Spector). Because of the central role that the cell membrane appears to have in the cataractous process, an investigation of the human lens membrane has been undertaken. This work has shown that in young individuals there is only one major polypeptide; however, with aging a smaller polypeptide also appears (Drs. Roy, Spector, Farnsworth). Further work was carried out on the role of calcium in causing aggregation of human lens protein (Drs. M. Fein, Spector) and on the glucosylation of human lens

protein in normal and senile and diabetic cataracts (Drs. A. Pande, W.H. Garner, Spector). Investigation of the effect of environment on the aggregation state and composition of the soluble lens proteins indicates that temperature, solvent and chemical modification have dramatic effects on both of these parameters (Dr. L.-K. Li). Parts of these studies were carried out at the Science University of Tokyo where Dr. Li spent a half year as a visiting scholar of the United States-Japan Exchange Program. The investigation on the increasing absorption and fluorescence associated with aging and cataract in human lenses was continued (Drs. S. Garcia-Castineiras, J. Dillon, Spector).

In the Immunology Laboratory the interaction between lens proteins was studied to elucidate the composition and stability of these complexes during aging. (Drs. W. Manski, K. Malinowski, E. Eilen). It was found that tissue-specific antigens in the cell membranes of corneal endothelium react with anti-tissue antibodies only in metabolically-active monolayers and dispersed cells. It was demonstrated that after metabolic inhibition the antigen-antibody complexes, like free antigen, undergo reversible transmembrane redistribution that leads to their internalization by the cells. Lateral redistribution (capping) of antigen-antibody complexes occurred on dispersed corneal endothelium cells but not cells organized in monolayers (Drs. Manski and T. Whiteside). Studies on corneal graft reaction supported the view that a persisting skin allograft not only sensitized a second-set corneal graft, but constituted a competitive inflammatory site. The relative strength of the sensitizing and competitive effects of a first-set skin allograft was found to influence the fate of a second-set corneal allograft. (Drs. Manski, Farris, A. Hofeldt). The stimulatory capacity of inbred Wistar-Furth cornea, skin, kidney and heart cells to stimulate inbred Fisher lymphocytes in mixed culture was compared and found to be the same for all of these cells. The data indicated that the density of histocompatibility antigens on the surfaces of corneal and other dispersed tissue cells was apparently the same (Drs. Manski, Malinowski, D. Tsai).

The Physiology Laboratory extended its studies on prostaglandin transport processes and has shown that the basic cell membrane is impermeable to thromboxane- B_2 , or prostacyclin, while tissues which transport prostaglandin accumulate these compounds against a concentration gradient. Prostacyclin appears to be transported more efficiently by the kidney than the lungs. Detailed studies on the kinetics of PG transport processes in the anterior uvea, choroid plexus and kidney cortex were carried out (Dr. F. DiBenedetto). It was shown that intraocular inflam-

mation caused by a chemical irritant, nitrogen mustard, has two distinct phases: the first is blocked by capsaicin, the second by indomethacin (Drs. L. Bito, C. Camras). The role of prostaglandins and prostaglandin transport mechanisms in the effects of asphyxia or ischemia on the retina is being studied (Drs. Bito, R. Siminoff). Studies are in progress on the effect of cholinesterase inhibitors on the sensitivity of extraocular muscles to cholinomimetics (Dr. Bito). A survey of free-ranging rhesus monkeys has fully confirmed our earlier finding of an apparently developmental infantile ocular hypertension and has, in fact, demonstrated a correlation between intraocular pressure and the rate of growth of the globe and orbit during the first 6 years of life (Drs. C. DeRousseau, Bito).

The Laboratory for Membrane Biology continued its work on the problem of fluid transport across epithelia. The hormonal control of water permeability across urinary bladder was investigated (Dr. J. Fischbarg and Dr. J. Bourguet Visiting Professor from Centre d'Energie Nucleaire, Saclay, France). The theory of convection and diffusion of solutes across unstirred layers (Dr. Fischbarg and Dr. T. Pedley Visiting Scholar from the University of Cambridge, England) and the hydraulic permeability of the ciliary epithelium in the eye was studied (Dr. Fischbarg and Dr. J. Brodwall, Visiting Fellow from the University of Oslo, Norway.) Work on a theoretical model for fluid transport continued (Drs. Fischbarg, J. Lim and Ms. S. Fischer). A new technique was developed for optical detection of changes in epithelial thickness (Drs. Koester, Fischbarg, Mr. L. Costache). Previous work on the osmotic permeability of the corneal endothelium was continued (Drs. Fischbarg, L. Leibovitch, Mr. R. Koatz). In collaboration with the University of Pennsylvania (Dr. B. Chance) corneal endothelial activity was assessed by the measurement of fluorescent emissions from cellular pigments (Dr. Fischbarg). Dr. Lim spent this year at the Max-Planck Institute fur Biophysik, West Germany, where with Drs. E. Fromter and L. Kampmann, he developed a new technique to measure the electrical properties of biological membranes. This method, utilizing five electrodes, was applied by them to measure the electrical phenomena in the corneal endothelium and gall bladder.

The Pharmacology Laboratory expanded its studies on the biosynthesis of hydroxy fatty acids from arachidonic acid in the rabbit conjunctiva and iris. It was observed that rabbit conjunctiva synthesizes HETE from arachidonic acid, indicating the presence of lipoxygenase in this tissue. Rabbit iris, however, did not produce HETE, although this tissue metabolizes arachidonic acid into prostaglandins (Drs. K. Eakins, P. Kulkarni, P. Bhattacharjee).

Work was continued on prostaglandin biosynthesis in ocular tissues of different species (Dr. Kulkarni).

In the Neurobiology Laboratory, studies were carried out on the single cell neurophysiology of the primate visual system using the rhesus monkey (Drs. P. Gouras, E. Zrenner of the Max Planck Institute, West Germany and J. Kruger of the Neurological Institute, Univ. of Freiburg, West Germany). The growth characteristics and ultrastructure of human retinal pigment epithelium *in vitro* have been studied (Drs. M. Flood, Gouras). Macular degeneration in the rhesus monkey is being investigated with electron microscopy. The defect involves an unusual deformation of the basal cell membrane and the basal lamina of the retinal pigment epithelium as well as changes in Bruch's membrane and the choriocapillaris. This abnormality provides an unusual opportunity to examine the pathogenesis of drusenoid degeneration of the retina (Dr. Gouras). The Neurobiology Laboratory also provides electrodiagnostic services, electroretinography and electrooculography to facilitate classifying retinal dysfunctions in humans.

The project on cataract caused by radiation continued (Drs. G. Merriam, B. Worgul). Attention was focused on the possible role of inflammation in the development of opacities following X-ray exposure. The results indicate that inflammation contributes little to radiocataract formation. In collaboration with the Department of Radiology (Drs. E. Hall, H. Rossi) the effect of radiosensitizers on the lens was studied and the cataractogenic potential of accelerated heavy ions in the 570 MeV range was investigated.

Patient Care

The Edward S. Harkness Eye Institute continues to maintain a position of preeminence in diagnostic capability and in medical and surgical technology for all aspects of patient care. The Columbia affiliated hospitals, but particularly Harlem and St. Luke's, are developing similar capabilities. The effort of complete modernization and renovation of the patient care facilities of the Edward S. Harkness Eye Institute continues. Renovation of the last in-patient floor is in progress and will be initiated in the Algernon B. Reese Laboratory of Ophthalmic Pathology before the end of 1979. There is a total dedication by the Department to these activities and a reasonable prospect now exists of achieving these goals in less than two years. A new ultrasound diagnostic laboratory has been established (Drs. Hofeldt, Cooper).

The total number of clinical visits in 1979 was 24,682. This includes 3,181 visits recorded in the Fight for Sight Children's Eye Clinic. The number of patients hospitalized was 2,695 for a total of 11,419

days. The total number of surgical procedures in 1979 was 2,703.

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Orthopaedic Surgery

ALEXANDER GARCIA

Stinchfield Professor of Clinical Orthopedic Surgery and Chairman • Director of Service

The year 1979 has been one of change and adjustments in the Department of Orthopaedic Surgery. In addition to changes in personnel, we have changed some of our format in holding Grand Rounds on Thursday mornings instead of Thursday afternoons and in changing our follow-up system so that the patients are followed in individual clinics and for individual problems. In the laboratories, Mr. Robert J. Pawluk has been appointed Director of the Biomechanics Laboratory. During this year, there has been renewed activity in the area of biomechanics.

It is expected that the new Helen Hayes Hospital will be open in the summer of 1980. The University has taken a more active role in the development of Helen Hayes Hospital in conjunction with the State Administration. Among the recent innovations has been the establishment of the Regional Bone Center which will be under the direction of Dr. Robert Lindsay, Professor of Clinical Medicine, a well-known endocrinologist with an interest in osteoporosis.

The Department of Orthopaedic Surgery, under the direction of Dr. Harold M. Dick, has been working with microsurgery in close collaboration with the Division of Plastic Surgery. During the course of the year, several innovative procedures have been developed which have been very well received.

Through the efforts of Jack Termine, our librarian, The Hibbs Library has been accepted into MEDLARS, the computerized literature retrieval services of the National Library of Medicine.

Teaching

The Twenty-Third Annual Postgraduate Course was held in June under the direction of Drs. Howard A. Kiernan, Jr. and Austin D. Johnston. Many attendees were from other states.

Three postdoctoral fellows were engaged in research programs during the year in the Orthopaedic Research Laboratories. Martin L. Sutcliffe, FRCS, Senior Registrar from Mr. John Sharrard's program in Sheffield, England, arrived for a year of research fellowship. He has been studying the effects of pulsing electromagnetic fields (PEMFs) on bacteria in culture, on healing of full thickness skin defects, and fresh fracture repair. These investigations have been carried on under the supervision of Drs. C. Andrew L. Bassett and Warren Kurtz. Mr. Sutcliffe is also reviewing the behavior of infected nonunions in the clinic. Dr. James S. Kort joined the Orthopaedic Research Laboratories for six months before beginning his orthopaedic residency. During that half year Doctor Kort initiated study, under Doctor Bassett's direction, of PEMF effects on the repair of transected rat sciatic nerves. His findings have been accepted for presentation in the program of the Orthopaedic Research Society meeting in February 1980. Dr. Hiromoto Ito, a research fellow from Nippon Medical School, Tokyo, Japan, in July assumed responsibility for the continuation of Doctor Kort's investigation of field effects on the repair of transected peripheral nerves. These studies are designed to document the rate and degree of motor return in long-term

animals. Doctor Ito will also be studying PEMF effects on transected spinal cords in rats.

In addition, the Orthopaedic Research Laboratories served a role in introducing work/study college, predoctoral and precollege students to its various programs.

During the year, Doctor Kurtz joined the Laboratories to take responsibility for studies of PEMFs on genetic patterns in bacteria.

Research

The dominant thrust of the Orthopaedic Research Laboratories continues to define biomedical effects of specific pulsing electromagnetic fields (PEMFs). As these definitions expand, it is becoming increasingly apparent that the therapeutic capabilities inherent in this approach extend well beyond the confines of the specialty of Orthopaedic Surgery.

Ununited Fractures: During the year, two major developments lifted this therapeutic program out of an investigative mode and placed it at the disposal of the general orthopaedic community. First, independent reports of clinical successes were presented at major meetings in England, Belgium, France, and Australia. Second, after an exhaustive review of clinical, research, teratologic and toxicologic data, the Food and Drug Administration approved the method as safe and effective for nonunions, failed fusions, and congenital pseudarthroses. At the present time, more than 1,500 cases have been treated and the success rate for adults continues to range from 80 to 85%. The savings over conventional surgical repairs (assuming no complications and union with the first operative procedure), already are considerably in excess of \$12,000,000. Furthermore, PEMFs have a proven benefit in actively infected nonunions and failed arthrodeses, where surgical approaches often are impractical.

It is anticipated that increasing acceptance by orthopaedists and a variety of pressures (e.g., patient preference, reduced cost and, unfortunately, malpractice considerations), shortly will make PEMFs the treatment of choice for the majority of ununited fractures. The success rate for congenital pseudarthrosis of the tibia continues to be less, at 66%, than for the adult group. Nonetheless, and in view of the desperate nature of this pathological entity, PEMFs have been broadly accepted by orthopaedic surgeons and already have saved significant numbers of children from amputation. In the past year, increasing numbers of delayed unions have been treated with a clear indication that this modality is extremely effective (greater than 95%) in promoting rapid union and significantly reducing disability time. At the present, a double-blind study of delayed union is in progress in

Sheffield and London (England) and Dundee, Scotland. Results should dispel the last vestiges of clinical skepticism about the effectiveness of PEMFs in this condition where, sometimes, union occurs spontaneously.

Microbiological Studies: Since modification of drainage from infected nonunions and arthrodeses (particularly after removal of failed infected total knee prostheses) has been a consistent feature in all cases of this type (now more than 150), attempts have been directed at identifying the possible bases for these beneficial results. Two obvious mechanisms exist, namely, either a favorable alteration of bacterial characteristics or an improvement in the host/parasite resistance, or both. Although the results of several investigations must be considered preliminary, as of this moment, several factors in both mechanisms appear to be responsible for the clinical observations: (1) Host/parasite resistance—Generally, PEMFs of a type in use for treating nonunions increase vascularity in bone (cf., subsequent paragraph, "Avascular Necrosis"). This factor, alone, could play a major role in changing infection/drainage patterns. Furthermore, recent studies have demonstrated a higher phagocytosis/kill rate of bacteria by leucocytes placed in the proper field; (2) Modification of bacterial characteristics—Growth rates of bacteria may be reduced, particularly with proper timing of field exposure during the cell cycle. This observation, reported last year, now is buttressed with data indicating a change in phage type (for *Staphylococcus aureus*) and induction of changes in enzymatic characteristics (β galactocidase) after exposure of organisms to appropriate field patterns.

The potential impact of these early findings on all branches of medicine demand a major effort to expand and consolidate these data in the immediate future.

Avascular Necrosis: During the course of treating nonunions of the femoral neck with PEMFs, several patients with concomitant avascular changes in the femoral head demonstrated improvement in their roentgenographic and symptomatic features. Accordingly, a joint investigative program to study PEMF features in avascular necrosis of the rabbit femoral head was launched with Stanford University. On the basis of that study, which has been accepted for reporting at the next Orthopaedic Research Society meeting, it is clear that single pulse fields will triple the rate of vascular penetration of the rabbit femoral head, once circulation is cut off. Furthermore, in a separate investigation of growth effects of the fields, a significant increase in the metaphyseal vascular bed has been observed. Armed with these findings, several clinical programs have been established.

One, to be conducted at the University of Newcastle, in England, is supported by the British Royal Navy and will investigate PEMF effects in caisson disease. Another, at the University of Birmingham, in England, will survey effects in Legg-Perthes disease. A third is being established at the Heart Institute in Miami and will assess the usefulness of the modality in femoral head avascular necrosis, following chronic renal dialysis/kidney transplantation. In the continuing clinical study, here, the method has demonstrated effectiveness in the carpal lunate (Kienboch's Disease), talar body, and femoral head (even when used to reverse the process following cuneiform osteotomy for slipped capital femoral epiphysis).

Osteoporosis: The three-year NASA-supported contract to survey PEMF effectiveness in preventing disuse osteoporosis was terminated in January after it had proven the effectiveness of this approach. Not only was a method of inducing and quantifying rapid loss of metaphyseal bone documented, but the single pulse prevented this loss almost completely in the disuse model. In an attempt to prove the safety of these fields for whole body exposure, mice were exposed before and during conception, embryogenesis, delivery and development to adulthood. No abnormalities were found with one exception. Mice growing to maturity in a single pulse field demonstrated a 10% increase in ash weight/body weight ratio when, and only when, voltages of 0.9 to 1.5 mv/cm were induced. Subsequently, in a joint investigation with Professor Richard Cruess at McGill University, this model and field pattern were studied biochemically and found to increase bone formation slightly above unrestrained controls and markedly above restrained controls. Simultaneously, there was a dramatic, 8-fold reduction in bone destruction over restrained controls, as judged by bone collagenase activity. In fact, restrained, field-treated animals had normal collagenase values. These results are being reported jointly with Prof. Cruess to the Orthopaedic Research Society meeting in February.

Neural Regeneration: During the year, increasing attention was focused on PEMF effects in neural repair and regeneration. It has been found that the single pulse will increase the rate of distal axonal migration, following transection of the rat sciatic nerve, two- to threefold above control value. Conversely, the pulse burst appears to slow axonal migration. These animal results, which have been accepted for presentation at the next Orthopaedic Research Society meeting, form a rational base to explain the increased rate and improved quality of neural regeneration now being observed in patients. In fact, two formal programs of clinical investigation in this area already have been launched, one at the

Hôpital St. Louis, at the University of Paris, and the other at the Robert Jones and Agnes Hunt Hospital at Oswestry, in England. At the present time, pilot studies of PEMF effects in paraplegic rats are in progress.

Wound Healing: Observations in patients with nonunions and open skin wounds indicate more rapid healing (epithelialization) in the wounds after institution of appropriate field therapy. On the basis of these findings, a study was designed to quantitate and define cellular patterns in dogs with full thickness skin loss. Results, thus far, demonstrate a major effect of PEMFs in reducing the inflammatory phase (polymorphonuclear leukocytes), increasing the rate of epithelialization (at least a doubling) and augmenting the orientation of healing dermal tissues. Protocols designed to assess PEMF effects in decubiti, chronic stasis ulcers, split thickness donor sites and in meningocele are being instituted in the clinic, both here and abroad.

Longitudinal Bone Growth: The clinical program, again, has been the leader in indicating pathways for research in this area. Eighteen months ago, it was noted jointly by Mr. Sharrard and Doctor Bassett that an increase in longitudinal bone growth was occurring in children with congenital pseudarthroses of the tibia when an epiphysis was included within an effective therapeutic field. Retrospective review of the congenitals has confirmed that the single pulse increases longitudinal growth by 1—2 mm./month/epiphysis. Conversely, the pulse burst stops growth for the interval of exposure. Similar results have been noted in rats and the mechanisms behind these patterns, now, are increasingly clear. For example, with the pulse burst, the zone of hypertrophic chondrocytes and part of the intermediate zone are eliminated by vascular invasion and only the proliferative zone remains intact. With the single pulse the chondrones are far more cellular than in controls.

At the present time, longitudinal growth studies in puppies are in progress to determine whether these effects are associated with an absolute increase or decrease in bone length at maturity. Already, the method is being studied in selected cases of unequal leg lengthening. Preliminary indications suggest that the effects seen in animals and congenital pseudarthroses are being paralleled in this group of patients. Finally, the method has been successfully applied recently, and for the first time, to correct an angular deformity (tibia valgum).

Basic Studies: During the year, the mechanism of healing of nonunions by PEMFs have been defined in dogs, both at the light and electron microscopic levels. Dr. Stephen Doty has played a major role in this endeavor. When combined with immobilization

and nonweight bearing (as in the patient population), the fields induce a sequence of definable events in the gap tissues of a canine radial nonunion. The fibrochondrocytes increase alkaline phosphatase activity (mainly pyrophosphatase), and mineralization of the extracellular matrix ensues. Once mineralization of the fibrocartilage has nearly reached confluence, vascular invasion from the bone ends is observed. The pattern of healing resembles, very closely, normal endochondral ossification and is identical to that produced by the introduction of rigid internal fixation by an A/O plate. Immobilization and nonweight bearing, in themselves, will not induce control animals to heal in the absence of an effective pulse pattern.

As a corollary to these studies, tissue culture investigations continue on the effects of PEMFs on chondrocyte calcium content. Data now accumulating indicate a major role for the glycocalyx in determining the type and quantity of field effect on cellular calcium. The rate and pattern of reconstitution of the cell surface coat, after enzymatic digestion, is being studied by Drs. Denis Moran, Harshad Chokshi, Dr. Doty, and Dr. Bassett.

Collaborative tissue culture efforts with Dr. Sylvia Fitton-Jackson's group at the Strangeways Research Lab in Cambridge, England, are continuing and have demonstrated changes both in collagen and proteoglycan synthesis by chick rudiments with different pulse patterns. Recently, a new collaboration was instituted with Professor H. Fleisch at the Pathophysiology Institut at the University of Bern in Switzerland. These studies will probe field effects on mineralization defects, on parathyroid/Vitamin D metabolite interactions, on osteoclasia in embryonic calvaria, and on tubular reabsorption of calcium and sodium by singly isolated nephrons.

Finally, the search for highly effective pulse characteristics to increase the rate of fresh fracture healing is in full progress. These studies utilize mechanical testing and histological techniques to analyze healing patterns in osteotomies of the rat radius. Already, pulses have been identified which result in a 100% increase in callus stiffness by 14 days after operation. Indications suggest that a 200% increase, not only in stiffness but bulk, is possible in the same time interval. Just as soon as this latter observation can be confirmed, an extensive clinical evaluation has been designed to test the "signal" in fresh tibial fractures in collaboration with Dr. Franz Burny at the University of Brussels and Mr. Sharrard in Sheffield, England. Doctor Burny has developed a non-destructive, quantitative technique to assess the progress of fracture healing in humans and will test these pulses against an experience with more than 2,000 fresh fractures of the tibia.

The Orthopaedic Biomechanics Laboratory, under the directorship of Dr. Robert J. Pawluk, is in its second year of operation investigating a diverse series of clinically oriented problems ranging from artificial knee ligaments, acetabular fixation, prosthesis wear testing to the mechanics of internal fixation during leg lengthening procedures. In addition, the Laboratory has undertaken a program to employ and train Columbia University premed candidates on an annual basis. Mr. Richard Fischer was first to occupy this position and collaborated on the artificial ligament study prior to his departure to medical school. Mr. Emilio Musso is the 1979-80 premed Biomechanics Research Fellow and is currently involved with prosthesis wear testing.

Two new programs of research were initiated in the past year. First, the evaluation of textured surfaces of implants with respect to improved fixation and second, the effects of screw holes on bone strength after plate removal. In addition, a series of collaborative studies between Mr. Pawluk and various orthopaedic faculty include: (1) The design and development of a strain gauged Wagner plate, in conjunction with a previously developed load-measuring ischial weight-bearing brace, for use in monitoring loading characteristics of leg lengthened patients after surgery (Dr. Dick); (2) A study of variables in surgical preparation techniques for improved acetabular cup fixation based upon retained subchondral bone and nonuniform distribution of multiple anchor holes (Dr. Nas Ser Eftekhari); (3) Continuation of knee wear testing studies for improved prosthesis design utilizing an ultrafine particle collection system (Dr. Eftekhari); (4) Stage 2 implant studies characterizing the effects of dacrom porosity for anchoring artificial anterior cruciate ligaments in dogs (Dr. Joel E. Rothermel). (5) Application of a one-leg-stance hip model for determining abnormal bone stress concentration as a function of prosthesis placement and/or design (Dr. Christopher B. Michelson). (6) John DiBiase, on a fourth year orthopaedic surgery research elective, worked under the direction of Doctor McIlveen on plate and screw fixation of osteotomies in dogs.

Dr. Eftekhari has undertaken studies on the effect of aspirin prophylaxis in thromboembolism, acetabular preparation as related to loosening, and clinical studies of 3—10 years follow-up on knee replacement. He has also been involved with the instrumentation and development of a biomechanical total hip prosthesis.

Dr. Hugo A. Keim conducted a study on the effects of Decadron in postoperative spinal surgery patients.

Dr. Howard A. Kiernan, Jr. has been involved in

the end result studies of meniscectomies, cruciate ligament repairs, and the end result study of Hauser procedures.

Dr. Michelsen has undertaken the study of stress across the pelvis during one-legged stance.

Dr. McIlveen reviewed the results of treatment of four-part fractures of the shoulder (with Dr. Charles S. Neer II).

Dr. Neer, in his work on total shoulder replacements, performed a new FDA field test for large glenoid. He also studied muscle transfers about the shoulder (with Drs. Tom R. Norris and Keith C. Watson) and three-part fractures (with Dr. George J. Zambetti, Jr.).

Dr. Marvin L. Shelton has undertaken studies on clinical application of electromagnetic stimulator for nonunion of long bone fractures, and external fixation of open fractures of the tibia.

Patient Care

During 1979 4,027 patients were admitted to The New York Orthopaedic Hospital, and 3,444 operative procedures were carried out.

<i>Classification</i>	<i>Number of Procedures</i>
Back	339
Upper Extremity	1,221
Lower Extremity	751
Hip	644
Knee	453
Miscellaneous	35

There were 25,277 clinic visits and 545 patients returned to our follow-up clinic during the year.

In the Orthopaedic Pathology Laboratory, under Doctor Johnston's direction, routine diagnostic service was accorded 1,700 patients, and 450 consultations were carried out. The number of deaths was 4, and no autopsies were performed.

Honors and Activities

Dr. Alexander Garcia was elected President of The Medical Board of The Presbyterian Hospital. Sir John Charnley, Director of Hip Surgery, Wrightington Hospital, England, was the Visiting Professor and the Twenty-Second Alan DeForest Smith Lecturer.

Dr. Bassett was Visiting Professor at the Massachusetts General Hospital; he talked on "Pulsing Electromagnetic Fields: Their Impact and Implications for Orthopaedic Surgery." He was Visiting Professor at the 23rd Annual Symposium on Rehabilitation in Ontario, Canada and talked on "The

Repair of Nonunion with Pulsing Electromagnetic Field." Doctor Bassett became a Membre d'honneur Societe Belge de Chirurgie Orthopaedique et de Traumatologie and was appointed to the Editorial Board of *Bioelectromagnetics*.

Dr. Robert E. Carroll was an invited guest at the Japanese Society for Surgery of the Hand and gave a lecture in Tokyo at their national meeting.

Dr. John R. Denton is a founding member of the New York Pediatric Orthopaedic Club.

Dr. Dick was elected President of the New York Society for Surgery of the Hand and is President-Elect of the New York Pediatric Society.

Dr. Eftekhar had the Visiting Professorship and Alvia Brockway Memorial Lectureship at the University of Southern California. He was Guest Visiting Instructor for the knee course of the American Academy of Orthopaedic Surgeons at the University of Southern California and was Guest Editor for the *Orthopaedic Review* special issue on sepsis.

Dr. S. Ashby Grantham was elected Secretary of the AAOS Committee on Examinations and Evaluation for the period 1978-1981 and Secretary of the New York Society for Surgery of the Hand.

Dr. Keim gave the Presidential Address—"The State of the EOA" at the Annual Eastern Orthopaedic Association Meeting.

Dr. Michelson became a Fellow of the American Association for the Surgery of Trauma and also of The American Academy of Neurological Orthopaedic Surgeons.

Dr. Neer was Visiting Professor at Campbell Clinic in Memphis, Tennessee and also at Baylor University in Dallas, Texas.

Dr. Shelton was made Medical Arbitrator for the Board of Education for the City of New York.

Dr. Frank E. Stinchfield was made Honorary Fellow of the Royal College of Surgeons and of the Royal Society of Medicine, both in England.

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We also wish to thank the anonymous donors to the Hugo A. Keim Scoliosis Research Fund for their generous contributions.

Helen Hayes Hospital

Nineteen seventy-nine has been an active year at the Helen Hayes Hospital with much increased activity directed towards the eagerly anticipated opening of the new hospital.

In conjunction with the anticipated new facility, closer ties with the University as a whole have been evolving, specifically with the Departments of Medicine and Neurology. Plans have been developed for establishment of a major bone metabolism unit as well as an epilepsy and seizure control center. These new units will feature advanced research facilities which will work parallel with the present clinical facilities in the care of patients with multidisciplinary disorders who will need intensive medical and neurologic involvement. The new research facilities will supplement the present such facilities for clinical orthopaedic research in the care of the multiply handicapped patient population as a whole.

Dr. George Van B. Cochran has developed a gait analysis laboratory funded to assess the biomechanics of gait in the disabled child as well as the evaluation of wheelchair positioning for optimal function and the effects of electrical stimulation on bone, cartilage, and soft tissue healing. Dr. Cochran's biomechanics laboratory has been in the forefront of those centers nationally in the close evaluation of functional development of the multiply handicapped patient while working parallel with the clinical care of such patients. The unusual and unique multidisciplinary approach to severely handicapping problems remains under the vigorous direction of Dr. Alice Garrett.

Over the past year, the children's program has enlarged with a significant increase in the outpatient population of cerebral palsy referrals from the many counties in New York State as well as the general northeastern United States. Dr. Raphael K. Levine continues to direct the Children's Service with his special interest in the multidisciplinary approach to the child with cerebral palsy. The Cerebral Palsy Service itself remains co-directed by Doctor Levine and Dr. Marguerite Gates, staff pediatrician. The charge of the service has always been directed toward optimal function of its patient clientele and has been able to evaluate its functional goals in conjunction with Dr. Cochran's gait analysis laboratory. The

Cerebral Palsy Service has enlarged its outreach program in maintaining close ties with the Rockland County Center for the Physically Handicapped, the Orange County Cerebral Palsy Center, and close ties with various centers in upper and western New York State.

Drs. Abraham C. Kovarsky and Matilda B. Brust, staff pediatrician, continue to co-direct the Spina Bifida Service with similar goals of maintaining its patient population in functionally optimal situations such that the child can eventually conduct himself in a socially acceptable and independent manner in society. The multidisciplinary approach to patient care is exemplified in the Children's Amputee Program which continues to expand under the co-direction of Drs. Brust, Kovarsky, and Rodolfo Reyes (Physical Medicine & Rehabilitation). Drs. Kovarsky and Reyes maintain their interest in the management of adult amputees as well.

During the past year we lost the services of Dr. Leela Rangaswamy and miss her involvement in the Scoliosis Service, Hand Service, and Adult Cerebral Palsy Service. However, the addition of Dr. Samuel Simon along with Doctor Kovarsky's increasing interest in scoliosis have led to a continued strong scoliosis program in the care of idiopathic, paralytic, and pathologic curvatures. The Adult Cerebral Palsy Service continues to thrive under the direction of Dr. Levine. Dr. Bigliani continues to direct the Adult Surgical Services with such vigor that the hospital has become a referral center for patients involved with severe shoulder problems. Under Doctor Bigliani's guidance, the hospital also has begun to make strides as a center for Sports Medicine and Adolescent Orthopaedic problems. We have been receiving increasing referrals from both Rockland County and adjacent Bergen County areas for the evaluation of the injured adolescent athlete.

We have been most fortunate within this past year to have added Dr. McIlveen to our Adult Surgical Service. Dr. McIlveen's initiative and enthusiasm have already become infective in furthering the care of severe traumatic orthopaedic problems as well as in joint replacement necessary as part of the care of severe arthritic patients.

The Arthritis Service under the direction of Drs. Alfred Becker and Howard Blank maintains a close tie with the Orthopaedic Service (Drs. Bigliani and McIlveen) in furthering the philosophy that multidisciplinary, multispecialty team approach is the optimal setting for the care of the arthritic patient.

Dr. John Nailor continues to be helpful in the care of the Adult Orthopaedic population with special interest in traumatic problems of the hand. Members of the staff continue to be involved on an educational

level both locally and nationally. Dr. Bigliani recently spoke in Maine on the Impingement Syndrome as being a treatable condition in the care of patients with shoulder problems. He also presented a talk at the American Orthopaedic Association Meeting in Puerto Rico on "Late Hematogenous Infection in Total Joint Replacement."

Drs. Garrett, Levine, and Kovarsky remain active faculty members of the New York University School of Orthotics and Prosthetics. Dr. Bigliani remains involved in the provision of orthopaedic care for the New York State Correctional Institutions. The Residency Program continues to flourish with a full complement of residents from The New York Orthopaedic Hospital as well as from the Harlem Hospital Center who rotate on a regular basis through the hospital. At all times, there is one resident at each level of training from the Columbia program at the

Helen Hayes Hospital along with a senior resident from the Harlem Hospital Center. Members of the residency staff are exposed to the direct involvement necessary as members of a team in the approach to functional care of the severely handicapped patient. Additionally, they participate in voluntary research projects, again with a goal of functional improvement in mind in the care of our patient population.

We anticipate that during the coming year with the opening of the new physical facility and the development of close affiliation with the medical and neurological services at the University along with the establishment of additional research facilities, that the Helen Hayes Hospital will very soon rank nationally at the top in the approach to evaluation of and treatment of the multihandicapped patient population as a whole.

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Otolaryngology

MAXWELL ABRAMSON

Professor and Chairman • Director of Service

Teaching

Otolaryngology teaching in the primary clinical year has been changed to allow groups of three students to spend five afternoons in the Otolaryngology clinic and conferences. The students also have an eight hour didactic course.

Undergraduate teaching is directed by Dr. Anthony F. Jahn. The popularity of our clinical clerkship in the third year is demonstrated by the increased numbers of students applying for our fourth year elective.

The Department currently has two residents in each of three years of postgraduate training in Otolaryngology. Our residency program directed by Dr. Andrew Blitzer, includes both didactic conferences and clinical training. In addition, it includes three yearly courses in temporal bone dissection, head and neck dissection and basic sciences.

Dr. Carl Wiesenthal and Dr. Nicholas Pontilena, joined our clinical faculty following completion of their residency at Columbia-Presbyterian Medical Center.

Beginning in 1980, we will integrate our training program with Harlem Hospital by adding an additional resident each year. The Columbia-Presbyterian Medical Center residents will spend one-third of their time at Harlem Hospital.

The Otolaryngology Department sponsored a postgraduate conference in Head and Neck Surgery in 1979.

Research

The work of the Fowler Memorial Laboratory has been directed in the following areas: 1) Acoustic principles of middle ear reconstruction (Dr. J. Tonndorf and Dr. M. Samara); 2) Directional hearing in bone conduction (Dr. J. Tonndorf and Dr. A. Jahn); 3) Interferometric measurements of basilar membrane displacement in living cats (Dr. S.M. Khanna and D. Leonard); 4) Cochlear nerve—single fiber experiments to study coding of the auditory nerve (Dr. S.M. Khanna, J. Allen, M. Teich and D. Leonard); 5) Effective contact area on bone conduction force and acceleration threshold (J. Queller and S.M. Khanna).

Dr. Cheng C. Huang and Dr. Maxwell Abramson continue studies on pathogenesis and mechanisms of bone destruction in middle ear cholesteatoma. Dr. Yuichi Shirahata of the Jikei University, Tokyo, Japan, has been a visiting Research Fellow, developing an animal model for cholesteatomas and chronic inflammatory bone absorption. Recent studies show that the chronic inflammatory reaction in chronic otitis media appeared to activate bone destruction through dynamic activity of mononuclear inflammatory cells and stimulated bone cells. Dr. Huang is also studying collagenase and invasiveness of head and neck tumors in collaboration with Dr. Andrew Blitzer and Dr. Maxwell Abramson. The studies are performed in human tumors and in animal model in the rat. Animal model will be used to test whether the

collagenase inhibition with a specific antibody will decrease tumor invasiveness and improve animal survival. Dr. Blitzer continues his research on the tumor host interactions between squamous cell carcinoma and cartilage in laryngeal tumors.

There are several ongoing clinical studies, including several collaborative projects. Dr. Robin Rankow and Dr. Andrew Blitzer collaborating with Dr. Chu Chang and Dr. Sung of the Department of Radiation Therapy in the treatment of patients with oral pharyngeal cancer with combined surgery and radiation. Dr. Blitzer and Dr. Martin Oster (Oncology Section, Medicine) have been implementing a multi-modality protocol for patients with advanced carcinoma of the head and neck, using pre-op cisplatin and belomycin, followed by surgery and radiation therapy. Dr. Jahn and Dr. Oster are studying the effects of cis-platinum on hearing. Dr. Jahn, who joined the staff this year, is also interested in the study of vertigo, temporal bone histopathology, and the mechanisms of hearing.

Dr. Mignogna has been carrying out an intensive study on a large group of patients with Wegener's granulomatosis.

Patient Care

The Department has inaugurated an Otoneurology Clinic with members of the Neurology and Neurosurgery Departments. This is a multidisciplinary approach to diagnosis and treatment of disorders of the VII and VIII cranial nerves including Bell's Palsy, vertigo, tinnitus and tumors involving the inner ear such as acoustic neuromas.

Statistics

Ophthalmology Admissions	13
PH Semi Private Admissions	766
PH Ward Admissions	202
ENT Harkness Admissions	243
Babies Hospital Admissions	471
Neurological Institute Admission	2
Total	1,697

Patients seen in the Otolaryngology Clinic 12,659

Staff Honors and Activities

Dr. Maxwell Abramson has been appointed to the Research Advisory Committee of the American Council of Otolaryngology. He was elected a member of the Board of Trustees of the Research Fund of the American Otological Society. He moderated a panel on Treatment of Acoustic Neuromas at the Eastern Section of the Triological Society. He has been a visiting professor and invited lecturer at the

University of Minnesota, University of Pittsburgh, New York Eye and Ear, Syracuse University, F.T. Hill Seminar in Waterville, Maine, Morningside Hospital, West Orange, New Jersey and at the New York City Neurosurgery Course.

Dr. Juergen Tonndorf has been visiting professor or invited lecturer at the German Otolaryngology Society, Otological Workshop, University of Göttingen, Berlin Otolaryngology Society, CHABA Meeting First International Tinnitus Seminar, University of Dusseldorf and Aachen, University of Groningen, Netherlands, University of Pittsburgh where he received special honors on three occasions this year. He received the Guyot Prize at the University of Groningen, the Shambaugh Prize from the Collegium ORLAS and was elected Vice President of the Collegium ORLAS an international research society in Otolaryngology.

Dr. John Conley has been invited lecturer and guest speaker at the Symposium of Facial Surgery, 3rd International Plastic Symposium, the British Head and Neck Society, the Yugoslavian Head and Neck Society, the Austrian Head and Neck Society, Mount Sinai Hospital Rhinoplasty Course and Head and Neck Postgraduate Course, Facial Nerve Symposium at the E.A.R. Foundation, the American Academy of Otolaryngology, New York Roentgen Society at the New York Academy of Medicine, American College of Surgeons and was honored guest at the Pack Foundation Annual Dinner Meeting.

Dr. Khanna was visiting professor at the University of Guelph in Canada.

Dr. Andrew Blitzer has been appointed to the Continuing Education Faculty of the Society of University Otolaryngologists and as a faculty member of the Self-Improvement Program in the American Academy of Otolaryngology. He was elected membership of the Association of Research in Otolaryngology and is an Associate Member of the New York Division American College of Surgeons Committee on Trauma. He is an Executive Board Member of the Foundation of Thanatology at Columbia University, Chairman of the Cancer Sub-Committee for Evaluation of Quality Care and Co-Director of the Postgraduate Anatomy Course, School of Dental and Oral Surgery, Columbia University. He presented lectures at the Triological Society and presented two poster presentations at the American Academy of Otolaryngology with Dr. Soly Baredes and Jeffrey Adelglass of our residency staff.

Dr. Anthony F. Jahn presented scientific papers at the Canadian Otolaryngology Society, The Triological Society, Eastern Great Lakes Head and Neck Surgeons' meeting, Hamilton, Ontario, and was a

guest lecturer at the Academy of Medicine in Toronto.

Dr. Thomas Fay continues an active program in Community Affairs for Noise Abatement and Health Effects of Noise including numerous radio and television interviews. He was an invited lecturer before public meetings in New York City. He prepared a course on Community Noise at the School of Public Health at Columbia University. He has prepared testimony on Environmental Noise Pollution at the New York City Council.

Dr. Cheng C. Huang presented papers at the Research Forum of the American Academy of Otolaryngology and at the Association for Research in Otolaryngology Annual meeting. Dr. Jeffrey Adelglass, of our residency staff presented talks at the New York Academy of Medicine and a poster presentation with Dr. Samara and Dr. Blitzer at the American Academy of Otolaryngology.

Dr. Lee Eisenberg administered the annual otolaryngology basic science course at the Walter Reed Army Medical Center and edited the catalog of Otolaryngic Audio Visual Training Aids, published by the American Council of Otolaryngology.

Dr. Richard Mega presented a scientific paper at the American Academy of Facial Plastic and Reconstructive Surgery on "Complications of Cryosurgery," was invited lecturer in Otolaryngology at Columbia University Teachers College and at St. Elizabeth Division of St. Clare's Hospital and Health Center.

Dr. Theodore Kramer continues as Chief, Section of Otolaryngology, Norwalk Hospital.

Dr. Frank Mignogna presented two papers at the American Academy of Facial Plastic and Reconstructive Surgery in January, with Dr. Soly Baredes and Dr. Richard Mega. He was a panelist at the American Association of Cosmetic Surgeons in Atlanta, Georgia.

Dr. Lawrence Pizzo lectured on Head and Neck Injuries at the College of Medicine and Dentistry of New Jersey.

Dr. Nicholas Pontilena lectured to the medical staff of Hackensack Hospital on Common Ear, Nose and Throat Diseases.

Publications

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Agarwal R, Blitzer A and Perzin KH: Granular cell tumors of the larynx. *Otolaryngol Head and Neck Surg* 87: 807-814, 1979.

St. Luke's Hospital Center

Dr. Stanley Whitfield continues as Director of Otolaryngology. He has lectured on Hearing and Smell to nursing administrators at Bergen County New Jersey and Management of Upper Airway Obstruction. He continues as Director of the Board of Chairman of the Malpractice Committee of the New York State Society of Otolaryngologists. He is a member of the Peer Review Committee of the New York County Medical Society.

Roosevelt Hospital

Dr. John S. Lewis was Vice President and Chairman of the Eastern Section of the Triological Society. He serves as Governor of the American College of Surgeons and chaired a panel on "Controversies in Neck Dissection," at the annual meeting of the American College of Surgeons.

The Department of Otolaryngology had a very active year in 1979. Weekly meetings were held during which residents presented cases and a monthly meeting held with the Department of Surgery in Head and Neck Cancer Problems.

Harlem Hospital Center

There has been an increase in clinical activities in Otolaryngology with the appointment of Dr. Lee Eisenberg as Director of Service. Consultations for example have increased from 44 to 246 during the period July to October 1979 in comparison with 1978. Dr. Eisenberg is particularly interested in urban health care problems and pediatric otolaryngology.

Acknowledgments

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In addition to the above, the Department gratefully acknowledges gifts received from many friends and colleagues in memory of Hazel and Milos Basek, to the Milos Basek Memorial Fund for Ear Research.

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Pathology

DONALD W. KING

Delafield Professor and Chairman • Director of Service

Introduction

It is with great regret we report the death of Jacob Furth on July 24, 1979. He had just been appointed a Distinguished Scholar at the Fogarty Center for the coming year. Dr. Furth was one of the outstanding figures in cancer research in this country from 1930 to the present. He had been at Columbia since 1961 as Professor of Pathology and Director of the Pathology Service at Delafield Hospital and later as Director of the Institute for Cancer Research.

Teaching

The major pathology course of Systemic and Neuropathology was moved from the first to the second year. An introductory course in general pathology was introduced in the first year with Drs. Branwood and J. Fenoglio as co-course Directors. Other course Directors are Dr. Duffy (Neuropathology), Dr. M. Blake (Oral Pathology), Drs. K. Perzin, M. Wolff, F. Silva and D. Knowles (Surgical Pathology), Dr. G. Nette (CCNY Biomedical Program), and Dr. L. Geller (Basic Science Review Course).

Four new courses in postgraduate education were presented this year along with the previous courses. The schedule now includes Advances in Surgical Pathology (Drs. C. Fenoglio, R. Richart), Advances in Clinical Pathology (Drs. J. Nicholson, T. Blumenfeld), Advances in Medical Pathology (Drs. A. Branwood, J. Fenoglio), Advances in Renal Pathology (Drs. C. Pirani, F. Silva), Advances in Liver Pathology (Drs. J. Lefkowitz, C. Marboe),

Orthopedic Pathology (Dr. A. Johnston), Urology (Dr. M. Tannenbaum). Additional postgraduate courses for next year will include Oral Pathology (Dr. D. Zegarelli), Eye Pathology (Dr. F. Jakobiec), Dermatopathology (Dr. D. Silvers), Pediatric Pathology (Dr. W. Blanc), and Neuropathology (Dr. P. Duffy).

Research

Pathobiology and Genetic Pathology

Dr. Richard Axel's laboratory has developed transformation systems which may allow the introduction of virtually any defined gene into cultured cells. He has performed a series of transformation experiments with a variety of different eukaryotic and prokaryotic genes in order to: 1) develop *in vivo* systems to study the functional significance of various features of DNA sequence organization; 2) as a means for gene purification where now classical routes involving recombinant DNA technology and molecular hybridization are inapplicable; 3) to examine the fluidity and promiscuity of the eukaryotic chromosome.

Dr. Axel has stably transferred a number of genes coding for selectable biochemical functions, such as thymidine kinase, to mutant mouse cells. Recently, he has demonstrated the feasibility of cotransforming cells with two physically unlinked genes. He has further demonstrated that the gene coding for the rabbit B-globin in transformed mouse fibroblasts is properly recognized by the transcriptional and processing enzymes of the mouse cell to generate RNA

indistinguishable from the mature globin mRNA of the rabbit erythroblast.

Dr. Carmia Borek's laboratory is concerned primarily in evaluating qualitative and quantitative aspects of neoplastic transformation induced by environmental agents such as radiation and chemicals using fibroblasts and epithelial cells. The most recent observations from her laboratory are as follows:

A protease inhibitor antipain, which inhibits DNA repair in bacteria, has been found to inhibit radiation induced oncogenesis when added within minutes after irradiation. Other experiments suggest that the use of linear interpolation from high to low dose radiation levels may lead to cancer risk estimates that are conservative.

They have successfully transformed *in vitro* human skin fibroblasts by x-irradiation and evaluated membrane-associated changes associated with neoplastic transformation.

Dr. Arline Deitch is Director of a Tissue Culture Core in a lung program project with Dr. Gerard Turino and has participated in collaborative studies on the *in vitro* production of connective tissue proteins and glycosaminoglycans. In addition, Dr. Deitch is Director of the Cancer Center's Cell Sorter Facility and has participated in projects involving cell cycle analysis with members of the Cancer Center.

Dr. Seth Goldberg continues his work on the B1s chromosome of *Drosophila* with Drs. Atwood and Komma of the Human Genetics Department. This work uses classical genetics to investigate new alleles which modulate expression of the still uncharacterized recombination DNA systems.

Research by Dr. Gabriel Godman and Dr. Janet Tannenbaum has centered on two related subjects: cell growth regulation and aspects of the structure, composition, function and cytopharmacology of the membrane-attached contractile and cytoskeletal apparatus.

With Dr. Wm Harrington, a globulin of normal sera that selectively inhibits proliferation or mitogenesis of certain cell types, including hepatoblasts, lymphoblasts and lymphocytes has been partly purified. Biological studies are in progress to elucidate the physiological role and possible clinical usefulness of this normal inhibitory protein with potential immunosuppressive and antitumor properties.

Aspects of the cytomusculature and cytoskeleton in movement of the cell membrane have been studied structurally, immunocytologically and chemically, with special reference to effects of cytochalasins and of local anaesthetics.

Dr. Reba Goodman's laboratory is concerned with the regulation and control of gene expression on *Sciara Coprophila*, a dipteran. They are presently en-

gaged in determining the cytological and biochemical events which accompany hormonal and heat shock induction of transcription.

Dr. Gerda Nette and Dr. Donald King continue their study on the reconstituted cell and its characterization, which includes mitochondrial DNA analysis, enzymatic studies, retention of the original genetic markers and morphological studies of cell growth.

They have utilized the method of cell reconstitution and fusion of senescent human skin fibroblasts with normal cell components including cytoplasts, karyoplasts and whole cell hybrids in studying cellular aging. In collaboration with Dr. Miranda they studied the phosphorylase isoenzymes by acrylamide slab electrophoresis in normal tissue and in the heart of a child with a fatal infantile form of myophosphorylase deficiency.

Drs. Henry Vogel and Ruth Vogel and their associates are continuing their studies on the regulation of protein synthesis in the arginine system of *Escherichia coli*, with emphasis on the translational component of repression, examined with transcripts of a cloned 1800-base pair Hind III segment including the internal regulatory region of *argECBH*.

Dr. Elena Schmidt, in collaboration with Dr. George A. Hyman (Medicine), Dr. Bruno Fingerhut (Urology) and Dr. David Zegarelli, is exploring the possible differences in RNA synthesis between neoplastic, pre-neoplastic and normal cells. An interesting correlation was found between the isotope labeling patterns of lichen planus of the oral mucosa and skin, cervical intraepithelial neoplasia of the female genital tract, various bladder tumors and acute leukemia.

Drs. Reed and Peters continue their research on blood proteins, particularly serum albumin. The focus of the work has been on formation of native three dimensional configuration, location of binding sites and possible roles of precursor forms. Refolding of denatured protein to native conformation has been successfully carried out with albumin as well as with isolated fragments of albumin, demonstrating the autonomy of different regions of the molecule.

Research on the mitochondrial malic enzymes and their role in normal and neoplastic cell metabolism was continued in Dr. Sauer's laboratory. The enzyme of special interest, an NAD (P)-dependent malic enzyme, was found to be present in mitochondria from adrenal cortex, testis, lung, spleen, thymus and intestinal mucosa.

Immunopathology

Dr. Daniel Knowles has continued the investigation of cytochemically demonstrable lysosomal enzyme activities as useful markers of lymphoid subsets

and the immunologic characterization of the extranodal lymphoid neoplasms. He has also begun, with Dr. James Halper and Dr. Leonard Chess (Medicine), a series of long-range investigative studies in the area of T cell differentiation. During this time, his laboratory has also functioned as a cell surface marker laboratory for the hospital.

Dr. Peter McCue with Dr. C. Fenoglio has studied localization of immunoglobulins in the skin and a variety of autoimmune diseases. In addition, he has been evaluating the usefulness of autofluorescence in distinguishing tumors of the APUD system and examined immunoperoxidase localization of myoglobin in an effort to devise a test which will allow the specific diagnosis of tumors derived from skeletal muscle.

Dr. Nicole Suciu-Foca's research activities this year have been concerned with the laboratory's participation in the 8th International Histocompatibility Workshop. HLA-Disease Association studies for inherited ataxia and juvenile rheumatoid arthritis have been investigated along with the continuing exploration of the genetic fine structure of the HLA region.

Dr. Ricardo Mesa-Tejada, in collaboration with Dr. S. Spiegelman at the Institute of Cancer Research, was able to demonstrate in sections of human breast carcinomas an immunohistochemically detectable antigen which is antigenically related to gp52 (the 52,000 dalton major glycoprotein of the mouse mammary tumor virus (MMTV)).

This antigen appears to be specific for breast carcinoma since it is not found in normal mammary epithelium, in benign lesions or other tumors. The potential clinical use of this antigen as a tumor marker is being explored in numerous investigations.

Dr. Clayton Natta has continued studies on the role of alpha tocopherol in the pathogenesis of sickling with Dr. M. Brin and Dr. L. Machlin of Hoffman-LaRoche. A study of the role of polyamines in the pathogenesis of sickle cell anemia, globin synthesis in sickle cell anemia and the thalassemias is being done with Dr. Leon T. Kremzner.

Medical and Surgical Pathology Specialties

Neuropathology

Dr. Richard Defendini remains active in the immunohistologic localization of hormones and peptides in the human central nervous system. He has demonstrated substance P in autopsy brain and spinal cord and proposes to study the fate of this putative neurotransmitter in the extrapyramidal motor system of patients with Huntington's chorea. Collaboration with Drs. Slater (Medicine, Harvard) and E. Zimmerman (Neurology) has produced evidence that a

large majority of neurons, but no glial cells, in the human brain contain a substance that is immunohistochemically indistinguishable from purified human renin.

Dr. Duffy, in collaboration with Drs. Rapport and Graf, has continued work on immunoperoxidase localization of glial fibrillary acidic protein in human brain tumors. A study of ependymomas was completed and application of the method to gliomas in culture is in progress. Drs. Duffy, Kremzner, and Cote have continued their studies of *in vitro* aging. This group is studying ornithine decarboxylase and superoxide dismutase activity in human fibroblasts in culture, the explants obtained from donors of varying ages.

Dr. Miranda's laboratory is a core unit of the H. Houston Merritt Clinical Research Center for Muscular Dystrophy and related diseases. Their main aim is to develop techniques for cultivation of human skeletal muscle and to use these cultures as a tool for studying hereditary and acquired neuromuscular diseases. In collaboration with Dr. Salvatore DiMauro (Neurology) and Dr. Gerda Nette, phosphorylase isoenzymes were studied in cultured human muscle and in biopsied muscle and autopsy material of various organs derived from patients with infantile phosphorylase deficiency and McArdle disease. With Dr. William Johnson and Dr. Gerda Nette, studies are continuing on various hexosaminidase deficiency diseases. Skin fibroblasts from these patients have been "immortalized" with SV40 and these are now being labeled with genetic markers for *in vitro* complementation studies of Sandhoff disease, Tay-Sachs disease and other newly recognized hexosaminidase deficiencies.

Dr. Leon Roizin and the Psychiatric Pathology Staff continue their studies on: 1) central nervous system and chromosomes in chronically heroin addicted monkeys, 2) ultrastructural findings in the lenticular nucleus following short and long term administration of prochlorperazine in experimental animals, 3) biogenic amines in glia and CNS blood vessel walls, 4) ultrastructural investigations of the CNS in Huntington's chorea and 5) the effects of misonidazole on the ultrastructure of mammalian cells cultured *in vitro*.

Dr. Herbert Barden's research includes studies on rejuvenation of the aging neuron through pharmacological removal of accumulated age pigment found in premature aging in rabbit brain. A neurotoxic effect of chronic reserpine treatment is also being studied.

Dr. Virginia Tennyson continues to investigate the effects of reserpine on the nervous system of pregnant rabbits and their fetuses. Counts of axonal terminals

in a large number of electron micrographs indicate that there are fewer axonal boutons in the putamen of the reserpine-treated fetuses than in controls.

Renal-Genito-Urinary Tract

Dr. Meyer Melicow has studied tumors of the testis in light of new findings regarding the important role of the spermatogone as the stem cell and the "embryoid body" as the precursor of non-seminomatous germ cell tumors.

Dr. Conrad Pirani has continued clinico-pathologic studies (in collaboration with the Departments of Medicine, Pediatrics and Surgery) in the areas of lupus nephritis, myeloma kidney, renovascular hypertension and allograft rejection. In addition, studies are continuing on enzyme-induced glomerular lesions; ultrastructural arteriolar changes in prehypertensive and hypertensive phases of hypertension; and an aminonucleoside-induced focal glomerulosclerosis, their aggravation by high lipid diets and possible prevention by hypolipidemic agents.

Dr. Maria Shevchuk is currently engaged in studying the DNA content of condylomata accuminata by microspectrophotometry, the spectrum of the abnormal deposits in muscle biopsies and the localization of prostate-specific acid phosphatase by immunofluorescence.

Dr. Myron Tannenbaum has initiated ultrastructural studies on all segments of the GU system containing normal, preneoplastic or neoplastic urothelium, or transitional epithelium. The presence of a specific morphological marker on the surface of the urothelial cell was characterized and called an "asymmetrical membrane" or "microridge." These morphological structures disappear from the surface of tumor cells. Collaborative work was undertaken with Dr. Patrick Trown, Department of Chemotherapy, Hoffman-La Roche, Inc. in studying the effect of 13-cis-retinoic acid and transretinoic acid on neoplastic urothelial cell induced by methyl-n-nitrosurea in urinary bladder. In animals receiving this carcinogen, but not receiving the above retinoids, a very significant number developed multiple papillary and/or invasive urothelial tumors. In the retinoid-treated animals there are statistically $p < 0.01$ smaller and fewer numbers of exophytic urothelial tumors in the bladders of these animals.

Dr. Philip Tomashefsky continued his investigation on the biology and therapy of urogenital tumors. His principal project involved the determination of the optimal physical parameters by which ultrasound destroys implanted murine tumors. In conjunction with Drs. B. Riven (Urology) and F. W. Longo (Urology), he has been able to ablate subcutaneous

implants of murine prostatic, bladder, Wilms', and mammary tumors under defined conditions of temperature, sonic power, and duration of treatment.

Dr. Tomashefsky continues to work with Drs. Romas (Urology) and Hsu (Microbiology) on the improvement of assay techniques for determining serum and bone marrow prostatic acid phosphatase. With Drs. Tannenbaum and Lattimer (Urology), Dr. Tomashefsky is involved in a study of carcinogenesis of bladder tumor in the rat by the combined action of MNU as a promoter and saccharine as agent.

Reproductive

Dr. Cecilia Fenoglio has continued her collaborative studies on the inter-relationship between cervical neoplasia and latency with respect to herpes virus. With Dr. McDougall at the Fred Hutchinson Cancer Center, studies have been aimed at the detection of herpes-specific messenger RNA and herpes-specific antigens in cervical tissues as well as in ganglia and peripheral nerves. They have been extended to include Dr. Richard Levine, Department of Obstetrics and Gynecology, Dr. Christopher Crum, Dr. Duane Townsend (Los Angeles), Dr. Ralph Richart and Dr. Purifoy (Leeds, England).

Dr. Fenoglio's studies on precancerous changes in ulcerative colitis have been evaluated in collaboration with Dr. Robert Pascal and Dr. Kathleen O'Toole. This study is aimed at using a combination of clinical, histological, and immunohistochemical techniques to define the preneoplastic lesions in patients with long-standing ulcerative colitis.

Dr. Ralph Richart has studied cervical intraepithelial neoplasia in diethylstilbestrol-exposed female progeny and the natural history of the vaginal and cervical changes which are found in DES-exposed girls and women in collaboration with Dr. Richard Levine. Columbia-Presbyterian Medical Center has been designated one of the referral centers for the New York State Department of Health Vaginal Adenosis Project. The division has also continued its interest in the development of an out-patient technique for female sterilization in collaboration with Dr. Robert Neuwirth. Clinical trials of a tissue adhesive, methylcyanoacrylate, which will produce tubal closure, and a delivery system, the FEMCEPT device, are underway in a number of collaborating centers in the Far East, Europe and Central America.

Cardiovascular Pulmonary

Dr. W. Blanc and Dr. A. Moessinger continue their research on the pathogenesis of congenital lung hypoplasia in the rat fetus. Lung growth is impaired when oligohydramnios is induced or when the fetuses are paralyzed by injections of curare. A model of

extrauterine pregnancy was also developed and appears that lung development is dependent on intrapulmonary pressure. It was found that fetal akinesia resulted in a multiple ankyloses and pterygium syndrome. With Dr. C. Kaplan (State University of New York at Stony Brook), Dr. W. Blanc has developed and applied an immunocytological technique to stain cytohemoglobin useful to detect cytomaternal bleeding. Dr. C. Navarro is continuing studies with Dr. Blanc on herpes virus placentitis.

Dr. A. W. Branwood is continuing his investigations on the evolution of the atherosclerotic plaque with special reference to aging. Dr. J. Fenoglio and Dr. A. Wit (Pharmacology) have continued their studies on the structural and electrophysiologic changes associated with cardiac arrhythmias. During the past year they completed studies in collaboration with Dr. T. D. Pham and Dr. P. Boyden (Pharmacology) on the structural basis of atrial arrhythmias in animals with spontaneously occurring arrhythmias. In collaboration with Dr. M. Weiss (Medicine) studies were begun to elucidate the natural history and etiology of cardiomyopathies in man. These studies are supported by studies on the structural changes of the ventricular myocardium in animals with naturally occurring congestive heart failure currently being investigated by Mr. G. Lattimer.

Dr. Jack Hagstrom is continuing collaborative studies with Dr. F. J. Veith (Department of Surgery, Albert Einstein College of Medicine) on the long-term function and morphologic effects of canine lung autografts with contralateral ligation of the pulmonary artery.

Dr. Mary M. L. Lee continues her work in Dr. Shu Chien's Cardiovascular Laboratory on ultrastructure (TEM and SEM) of blood vessels and red blood cells under various experimental conditions. She also is collaborating with Dr. Alice Maniatis (Hematology, St. Luke's Hospital) on immunoelectronmicroscopy to study antigen-antibody sites on the surface of the red cell membrane.

Dr. Philip Ursell has been studying tissue effects surrounding artificial chambers that are used for transplanting pancreatic islets in the reversal of chemically induced diabetes.

Dr. H. Joachim Wigger has continued his investigation of the ultrastructural localization of angiotensin converting enzyme. In association with Dr. P. Caldwell, he is studying the pathologic effects of the intravenous administration of antibodies and antibody fragments against converting enzyme in the lung.

Developmental Methods and System Analyses

Dr. Blumenfeld with Howard Cheskin continued

to develop the potential clinical laboratory applications of fluorescence polarization of body fluids. They reported the significance of fluorescence polarization values of amniotic fluid as a predictor of newborn respiratory distress syndrome.

Howard Cheskin is continuing work on the relationship of bilirubin concentration to bilirubin binding on albumin and red blood cells to create a cellular model which can be used to determine the kinetics of bilirubin binding under different physiological and pharmacological conditions.

Dr. P. Chauhan is collaborating with the Dept. of Urology on studies of fine needle aspiration biopsy for the diagnosis of diseases of the prostate.

Dr. Ellner's research activities involve the rapid detection of hemolytic streptococci in throat and vaginal cultures; the development of an improved transport medium; and the development of latex test for streptococci, *Haemophilus influenzae*, and *Neisseria gonorrhoeae*.

Dr. Angus Sampath is collaborating with Dr. P. T. Dickinson of the Department of Medicine on a study of community risk of infection with meningococcus type W-135. There has been a significant increase in the number of patients admitted with infections due to this serotype of *N. Meningitidis*.

Dr. D. Fink and Dr. R. Galen have used the principles of the predictive value method, ROC curves, and decision analysis to evaluate the diagnostic utility of immunologic techniques for measuring prostatic acid phosphatase. Future goals will be to apply these techniques to current and new laboratory tests so as to establish their diagnostic usefulness.

Dr. Ross Grey and Dr. R. Davis (Northwestern University) are working on fertility regulations investigating a chemical method of vasectomy.

Dr. John Y. Kiyasu (Roosevelt) developed new amylase methodologies and has continuing studies concerning serum amylase levels in chronic pancreatitis. A study of LDL-cholesterol levels on inpatients versus outpatients is in progress.

Dr. Michael Pesce's research involves: detection and monitoring of children with disorders of galactose metabolism, developing new assays for monitoring therapeutic drugs and their metabolites and developing procedures for measuring protein hormones.

Dr. Louise Phillips (Roosevelt) is determining which patients benefit most from installation of a LaVine peritoneal-venous shunt to reinfuse ascites fluid from the peritoneal cavity to the vasculature.

Dr. A. Shahidi (St. Luke's) has studied the effect of contamination levels in mixed cultures on antimicrobial susceptibilities tested by autobac, a comparison of API 20 E, Micro ID and Enterosep 20 for

identification of gram negative bacilli and a comparison of API-20E and microscan panel for identification of gram negative bacilli.

Dr. John Nicholson with Drs. R. Winters, R. Dell, T. Anderson and W. Heird (Pediatrics) studied optimization of the amino acid composition of intravenous fluids for total parenteral nutrition. With Dr. Pesce, clinical laboratory tests in disorders of carbohydrate metabolism, particularly diabetes and galactosemia were developed and with Dr. I. Mandl and Dr. M. Marder (Dental and Oral Surgery) alterations in salivary secretion in juvenile diabetes melli-

tus were studied.

The Clinical Chemistry Laboratory expanded service providing routine determinations during 12 hours each day for six days a week, and during an eight-hour period on Sunday. In addition, service offered during emergency hours was expanded.

Patient Care

The following statistics summarize the laboratory determinations at Columbia Presbyterian Medical Center and affiliated hospitals.

	<u>Presbyterian Hospital</u>	<u>Babies Hospital</u>	<u>Sloane Pathology</u>	<u>Orthopedic Pathology</u>	<u>Neuro- Pathology</u>
Number of Deaths	906	167			
Autopsies	225	129			
Surgicals	10,704	2,187	4,500	1,700	932
Cytology	6,200		27,500		
Clinical Chemistry	2,297,173				
Blood Bank	303,454				

	<u>St. Luke's</u>	<u>Harlem</u>	<u>Roosevelt</u>	<u>Mary Imogene Bassett</u>	<u>Overlook</u>	<u>Morristown</u>
Deaths	734	873			719	542
Autopsies	245	139	138	107	169	143
Surgicals	10,628	5,882	9,168	4,054	10,978	12,304
Cytology	14,655	16,914	18,378	7,913	8,120	21,255
Clinical Chemistry	3,084,585*	1,990,300	1,054,944	428,059	1,288,458	2,100,000
Blood Bank	151,110	150,000	55,636	25,766	118,530	114,223
Microbiology	1,812,646*	580,360	118,215	63,506	54,682	44,589
Hematology	1,955,652*	356,000	432,866	72,602	230,148	115,179

*Based on CAP workload units

Honors

Dr. W. Blanc chaired a session on pediatric pathology at the 7th European Congress of Pathology in Valencia, Spain and will direct the Pediatric Pathology session at the next International Academy of Pathology meeting in Paris. Dr. Blanc participated in the Ciba Foundation Symposium on perinatal infections in London.

Dr. T. Blumenfeld is Chairman, Capital Budget Review Committee of Presbyterian Hospital, a member of the International Advisory Board, International Health Resource Center, Kauai, and member of the Quality Control Committee, New York State Society of Pathologists.

Dr. C. Borek was elected a Fellow of the New York Academy of Sciences; she is on the Council of the Tissue Culture Association, Editorial Board of *J. Environ. Path. & Toxic.*, a member of the New York Academy of Sciences conference organizing committee, a member of the Aging Review Committee of the NIA, and the special committee on Argonne National Labs (DOE).

Dr. D. Cowen was awarded a gold plaque by the American Association of Neuropathologists in grateful recognition of his dedication and contribution to neuropathology.

Dr. P. Duffy was named co-chairman of the American Academy of Neurology course and presented

research seminars at New York University and at the University of Illinois.

Dr. C. Fenoglio was appointed to the Editorial Boards of *Ultrastructural Pathology*, *The American Journal of Diagnostic Gynecology and Obstetrics*, and *Investigative and Cell Pathology*.

Dr. R. Galen presented the keynote address, "Strategies for Appropriate Laboratory Test Selection" at the First Southeast Asian & Pacific Congress of Laboratory Medicine in Singapore.

Dr. L. Geller was reappointed to the College Curriculum Committee and also reappointed as Chairman of its Subcommittee on Evaluation.

Dr. R. Goodman gave invited talks at the Cancer Institute in Peking and the Institute of Cell Biology in Shanghai.

Dr. J. Gorman was interviewed in the Blood Bank Laboratory by the B.B.C. for viewing on PBS TV.

Dr. J. Kiyasu was elected a Fellow of the National Academy of Clinical Biochemistry and Association of Clinical Scientists. He also chaired a session on Lipids at the National Meeting of the American Association of Clinical Chemists.

Dr. M. Melicow received the Ferdinand C. Valentine Award from the Section on Urology of the New York Academy of Medicine and delivered a lecture entitled "Uropathology: Past, Present and Future."

Drs. Miranda and Hays were invited by the Surinam government to organize and participate in a Symposium on Neuromuscular Diseases sponsored by the Organization of American States and the Alcoa Foundation.

Dr. C. Natta was invited to present a paper on "Polyamines and Sick Cell Anemia" at the Howard University Postgraduate Course and "Sickle Cell Disease in the International Year of the Child."

Dr. J. Nicholson served on the CAMP NYDA committee of the New York Diabetic Association and as advisor on diabetes for the American Field Service.

Dr. M. Pesce has been selected to serve on the Editorial Advisory Board of *Laboratory Management*.

Dr. T. Peters served as Chairman of the Clinical Chemistry Section of the Classification Panel of the F.D.A., and was named liaison member of the Council of the newly formed National Reference System for Clinical Chemistry.

Dr. C. Pirani was on sabbatical leave of absence from January 15 to July 15 as Visiting Professor in the Nephrology Service, Tenon Hospital (Pierre and Marie Curie University), Paris, France. He delivered a number of lectures in Renal Pathology in Paris, London and Milan.

Dr. L. Roizin was re-elected Editor, *Journal of Neuropathology and Experimental Neurology* and *Acta Neurologica* (Italy). He was elected Editor, *Neurobehavioral Toxicology*. He was re-elected Chairman, Committee on Pathology and Laboratory Medicine, Offices of Mental Health and Mental Retardation and Developmental Disabilities. He was elected Secretary and Chairman of the Program Committee, International Research Group on Neurotoxicology, World Federation of Neurology.

Dr. A. Sampath has been appointed to the Subcommittee on Microbiology, Bureau of Laboratory Improvement of the Health Department of the City of New York.

Dr. N. Suciu-Foca's laboratory was selected as "International Cross Reference Laboratory" for the 8th Workshop on HLA.

Dr. J. Wigger was an invited speaker at the Annual Meeting of the German Pathology Society.

Donors

Funding for the Department has been through the HRA, NIGMS, NIA, NEI, NICHD, NCI, NIH, as well as the Nestle Foundation, New York Heart Association, Irene Heinz Given and John LaPorte Given Foundation, Hoffmann-LaRoche, Inc., Muscular Dystrophy Association of America, United Cerebral Palsy Association, Parkinson's Disease Foundation, National Ileitis and Colitis Foundation, Frank Marianni Fund, Arthur Purdy Stout Society, and the Higgins Cabot Fund.

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Pediatrics

MICHAEL KATZ

Carpentier Professor and Chairman • Director of Service

The Department and the Service have taken an active role in the planning of the reorganization of the Medical Center. This has primarily concerned improvements in the physical plant of the Hospital and in new programmatic approaches. As a consequence, the Obstetrical Service will move into the new Babies Hospital, thus creating a true maternal and child health center. Both hospitals, Babies and Sloane, will retain their traditional identities but their collaboration—also traditional—will be greatly facilitated.

Reconstruction of Vanderbilt Clinic has begun and at its conclusion, during 1980, it will provide an environment of quality for the ambulatory services.

The Hattie Alexander Lecture was delivered this year by Dr. Robert Petersdorf of the University of Washington who spoke on "The Head, The Heart, and The Kidney: Three Models of Experimental Infections."

This year also saw the establishment of the new Lectureship in memory of Stephanie Lynn Kossoff, who had died of cystic fibrosis. Through the generosity of her parents, Mr. & Mrs. Burton Kossoff, it will be possible each year to invite a major scientist whose work relates to pulmonary physiology. The first Kossoff lecturer was Dr. Richard Charles Talamo of Johns Hopkins University School of Medicine, Baltimore, Maryland who spoke on "New Directions in Cystic Fibrosis Research."

The Department was awarded a Rudin Visiting Professorship for the year 1979. Our guest was Dr. Charles Scriver, who spent one week with us, interacting with many of his scientific colleagues and teaching house officers. He delivered the Rudin Lec-

ture, "Predictive Medicine: A Goal for Genetic Screening," and a lecture on "Mendel, Phosphate, and Rickets."

Other distinguished lecturers included Dr. Jonathan Wigglesworth of Hammersmith Hospital, London, Dr. Stanley Plotkin of University of Pennsylvania, Dr. Ranjit Chandra of Memorial University of Newfoundland, St. Johns, Newfoundland, Dr. Michael Cohen of Albert Einstein College of Medicine, and Dr. O. Ransome Kuti of the Institute of Child Health, Lagos, Nigeria.

Dr. Ralph Dell was appointed Deputy Chairman of the Department and Deputy Director of the Service. Dr. Leo F. J. Wilking was appointed Acting Director of Pediatrics at St. Luke's Hospital. Dr. Sergio Piomelli has been appointed Director of the Division of Hematology-Oncology succeeding Dr. James Wolff who became Professor Emeritus and assumed the post of Director of the Cancer Control Program of the Columbia University Cancer Center. Dr. Karen Hein has been appointed Director of the new Division of Adolescent Medicine. Dr. Darryl DeVivo has been appointed Sidney Carter Professor of Neurology and Professor of Pediatrics.

Teaching

Teaching activities of the Division of Perinatology centered around the fellowship training program which is designed to prepare clinicians for a leadership role in perinatal care and research in tertiary centers. The objective is training of physicians in basic and clinical research so that they may form a link between basic sciences and clinical specialties.

Research training is conducted within the framework of our current research projects in which the trainee is an active participant. There are currently nine trainees.

Members of the Division of Metabolism and Nutrition have participated in the graduate teaching program of the Institute of Human Nutrition and in ad hoc rounds, seminars and conferences at several other teaching institutions, in addition to active participation in departmental functions. They also participated in 10 postgraduate symposia throughout the United States.

Dr. Martin A. Nash has continued his participation in the renal section of the course in Abnormal Human Biology for second year medical students and jointly with the Division of Nephrology of the Department of Medicine in various other teaching activities for medical students, housestaff, and faculty.

The Division of Growth and Development continues to cooperate in various teaching programs, including courses: "Biochemical and Physiological Basis of Human Nutrition," for the students of the Master of Science in Nutrition Program of the Institute of Human Nutrition; "Clinical Nutrition," for the second year students of the medical and dental schools; "Perinatal Nutrition," for the graduate program of the School of Nursing; "Growth and Development," for the graduate program of the Institute of Human Nutrition.

Dr. John F. Nicholson's teaching activities included six postgraduate courses dealing with diabetes mellitus.

Drs. Fred Agre and Fred Bomback have been given the Teacher of the Year Award by the Pediatric Housestaff.

A new training program in developmental/behavioral pediatrics was started under the direction of Dr. Candace Erickson. This program, planned collaboratively with Child Psychiatry, has been funded for three years by the William T. Grant Foundation and will supplement existing services coordinated by Dr. Harriet McGurk.

Dr. Bernadette Fiscina has been appointed Pediatric Instructor for the Department of Nursing PNP Master's Program. Dr. Myriam Feig has assumed the role of coordinator of the outpatient pediatric rotation for 3rd and 4th year medical students. The third year program has been expanded to include outpatient experience within pediatric subspecialties and well-baby care in the Group Practice setting. This year, the entire clerkship is provided at CPMC without rotation to other hospitals. Harlem Hospital, previously sharing some of the educational responsibilities for students rotating at CPMC, now has separate groups of third year students assigned there

for the full outpatient experience.

The Pediatric Ambulatory Care Division has assumed responsibility for two groups of first year medical students in the Physician/Patient Relationship course.

The Division of Allergy is continuing weekly conferences for review of basic and clinical immunology for members of the Division and part-time Allergy Clinic attendings.

The Curriculum Committee recognized the need for more time in pediatric education than the currently allotted six weeks and added an introduction to perinatal medicine to the student curriculum in the third year. The introduction, a part of the OB/GYN rotation, concentrates on examination of the well baby and identification of the high risk infant.

Teaching and evaluation of students has been strengthened by a one-to-one session between each student and Dr. Stephen Atwood, Director of the Division of Education.

Dr. David Hodes continued to play a major teaching role in the first year course in Microbiology and in the Infectious Disease section of the second year course in Abnormal Human Biology.

In July, 1979 the Harlem Hospital Center's Department of Pediatrics began a major revision of its undergraduate and postgraduate educational program. The undergraduate medical program involves the education of two to three medical students for three week periods throughout the academic year. During their three week pediatric rotation at Harlem Hospital, these students are involved in a variety of outpatient activities that expose them to primary care. The revision of the residency program involves the development of small group practices composed of faculty and residents who provide comprehensive pediatric care for a defined group of patients.

At Overlook Hospital Dr. Katz discussed a rare case of congenital malaria diagnosed and treated in the Pediatric Unit.

Dr. Solomon J. Cohen has introduced regular ethics rounds for the pediatric staff. They include representatives from the behavioral sciences, from the social service department, and from the Chaplain's office.

Dr. Arnold Constad continues to be a state wide speaker and advocate of child safety as a director of the Physicians for Automotive Safety.

The elective in Primary Care Pediatrics continues to be very popular attracting medical students from the many parts of the United States. The preceptors include Drs. Cohen, Joseph Boylan, Frank Frenda, and Alexander Horowitz.

At St. Luke's Hospital, Dr. Dennis J. Allendorf continued to supervise the residency training pro-

gram. His postgraduate continuing education course began its sixth successful year. An elective course for fourth year students in perinatology was initiated by Dr. Farrokh Shahrivar. Dr. Richard Mones has assumed responsibility for the Ambulatory Care course given to third year students.

Research

Research activities in the Division of Perinatology have been centered primarily about the two major programs: Special Center of Research (SCOR)—Newborn Lung Center, and Major Research Program (MRP) Fetal Hypoxia and Maternal Smoking. In the SCOR program Dr. John Driscoll is continuing to study the long-term follow-up of 302 infants who survived respiratory distress syndrome.

Dr. Karl Schulze is studying the bioenergetic and cardiorespiratory responses of the low birth weight infant to stress of disease. These studies have demonstrated large variations in minute ventilation and oxygen consumption occurring spontaneously during relatively short periods of study.

In the MRP Dr. Raymond Stark, in collaboration with Dr. Harold Fox (Obstetrics & Gynecology), and Dr. Salha Daniel (Anesthesiology) is studying the cardiovascular, respiratory and biochemical responses of the fetus to hypoxia and maternal smoking.

In collaboration with Drs. L. Stanley James and Inez Mandl (Obstetrics and Gynecology), Drs. June Morishima and Takayuki Nogawa continued their efforts to study the role of elastin in pathogenesis of respiratory distress syndrome. They have successfully established clonal cell cultures of lung cells from fetal lamb which produced elastin *in vitro*.

Dr. Tove S. Rosen is continuing her follow-up studies of the effects of methadone on the somatic and neurobehavioral development of the infant and young child born to mothers on methadone maintenance. In addition, in collaboration with Dr. Michael Rosen (Pharmacology), she is investigating the effects on the hearts of newborn rats of prenatal administration of diphenylhydantoin.

Dr. Joan Regan is continuing her studies of epidemiology of group B streptococcal disease (GBSD)—a leading infectious cause of newborn morbidity and mortality. She has developed a rapid detection system that permits identification of the colonized parturient prior to delivery. Her work has resulted in a reduction of mortality from 65% of the infants born to unscreened parturients who developed GBSD, to 11% of those born to screened parturients.

Dr. Adrien Moessinger is studying factors that lead to lung hypoplasia in the fetus.

Dr. Thomas Anderson's studies of the role of intravenous lipid emulsions in parenteral nutrition of premature infants are nearing completion. The research of Drs. Heird, Winters, Nicholson and Dell concerning parenteral amino acid requirements continue as do the studies of Drs. Heird and Winters concerning the effect of quantity and quality of caloric intake on nitrogen retention during parenteral nutrition. Studies of the metabolism of intravenously administered fat emulsions are also in progress. Dr. Heird, with Dr. Michael Malloy, (postdoctoral fellow), continues studies of brain growth and development in puppies fed exclusively by the parenteral route. Dr. Steven Schwarz, (post-doctoral fellow), under the supervision of Dr. Heird, is studying the role of colostrum in the growth of intestinal mucosal in newborn beagle puppies.

Dr. Martin Nash has received a grant from the National Institutes of Health to study acid balance in various forms of renal acidosis. He has continued his research on the natural history and treatment of renal diseases through the International Collaborative Study of Kidney Disease in Children.

Dr. Dell together with Drs. DeWitt S. Goodman and Robert Palmer (Medicine) continued the investigation of the kinetics of the long term turnover of plasma cholesterol. Dr. Rajasekhar Ramakrishnam has developed mathematical models to determine optimal sampling strategies for a given experimental design. Drs. Dell and Paul J. Cannon (Medicine) continued their series of experiments designed to measure regional myocardial blood flow, utilizing the 133 xenon washout technique, and studies of methods for assessing myocardial performance under stress of exercise utilizing a 201 thallium. Dr. Dell continues his studies on the effect of the different body compositions of the newborn animal on the buffer response to acute hypercapnia.

Drs. Dell, Hymie Nossel (Medicine), and Karen Kaplan (Medicine), have begun a collaborative effort to develop a mathematical model for fibrinogen turnover.

Dr. Winick and his associates have continued their research on the effects of early malnutrition on brain development. During the last year their studies have demonstrated that a reduced brain concentration of N-acetyl-neuraminic acid is responsible for the behavioral changes observed in adult rats affected by malnutrition during lactation. Dr. Pedro Rosso's research remains focused on normal aspects of maternal-fetal exchange of nutrients and the effects of maternal dietary restrictions. Studies completed during the last year have shown that transfer of folic acid in human placenta is a non-active process mediated by carriers whereas biotin transfer requires both the

presence of a carrier and energy consumption.

Drs. Michael A. Pesce, and John Nicholson have conducted clinical laboratory tests in disorders of carbohydrate metabolism, particularly diabetes and galactosemia.

Drs. Irwin D. Mandel and Michael Z. Marder (Dentistry), and Dr. John Nicholson investigated alterations in salivary secretion in juvenile diabetes mellitus. Additionally, Drs. Nicholson, Anderson and M. Richard Koenigsberger, employing the stable isotope ^{15}N are assessing management of ketotic hyperglycemia by measurement of pool size, turnover rate and synthesis of glycine.

Dr. Akira Morishima, in collaboration with Dr. Arthur D. Bloom, continued the cytogenetic studies pertaining to narcotics and antagonists.

Dr. Bernadette Fiscina has completed her design of a home-based medical record for use with inner-city children and has begun a trial of its use in the Pediatric Group Practice. She initiated a study of the effects of medical records on primary care in the Pediatric Acute Care Unit in collaboration with the Medical Records Department.

Dr. Nicholas Cunningham's research on therapy and follow-up of child abuse cases and their families continued in collaboration with Babies Hospital Social Service and the new Family Center in Child Psychiatry.

Drs. Gabriel Haddad, Hedi L. Leistner and Robert B. Mellins in collaboration with Drs. Ralph A. Epstein (Anesthesiology), Mary Ann Epstein (Chemical Engineering), John M. Driscoll, Jr., Warren G. Groden (Anesthesiology), and Professor Tze Lai (Mathematical Statistics) have continued to pursue studies of the effect of maturation and sleep on cardiorespiratory control in normal infants and infants with abortive Sudden Infant Death Syndrome (SIDS). Dr. Haddad presented the results of this work at an international symposium on neonatal monitoring in Oxford, England.

Dr. Alex Stalcup, Mr. Joel S. Lipset and Dr. Mellins in collaboration with Dr. Gerard M. Turino (Medicine) have pursued studies on modulation of converting enzyme activity by PO_2 both in the intact animal and in cultured endothelial cells. Drs. Leila Mei Pang, Hugh O'Brodovich, Stalcup and Mellins have pursued studies of the effect of acidosis and hypoxia on the level of circulating vasoactive chemical mediators and on fluid exchange in the lung in the intact sheep. Dr. Dennis Davidson and Dr. Stalcup are pursuing studies of the role of pulmonary and placental converting enzyme activity and circulating vasoactive chemical mediators on the transition from the fetal to the neonatal state. Drs. Richard B. Silver, Stalcup, Mr. Lipset and Dr. Mellins have developed

a new assay for the kallikrein-kinin system. Drs. Dan Cooper, Anthony L. Mansell, Weiner, and Mellins have pursued studies of the effect of thalassemia and chronic blood transfusions on lung growth and development. Ms. Jane Andersen has completed a study on cough suppression complicating childhood depression.

Drs. Piomelli and Graziano have continued their interests in the study of chelation therapy in Cooley's Anemia and in the development of techniques for transfusing young red cells to treat these children. Dr. Piomelli and Ms. Seaman continue their study of red cell biochemistry and metabolism of the red cell aging. Drs. Piomelli and Graziano continue their studies of lead poisoning in childhood, examining the effects of lead on the hematopoietic system, and evaluating the use of new chelating agents such as 2,3-mercaptosuccinic acid, a promising oral drug for treatment of childhood lead poisoning.

Dr. Vora has continued her research on the isozymes of the red cells. She has defined the subunit structure of the enzyme phosphofructokinase and has demonstrated that the muscular and hematological abnormalities observed in patients with deficiency of this enzyme are due to the specific lack of a single subunit. Dr. Anneliese Sitarz has studied the effect of the drug piracetam on sickle cell anemia.

Drs. Davis, Bernard R. Feldman, Charles H. Feldman, Theodore Sher and Juan Giraldez have continued studies of theophylline pharmacokinetics. Dr. Feldman presented data relating to the effect of alteration of protein and carbohydrate dietary constituents on theophylline metabolism at the American Thoracic Society meeting. Drs. Sher, Davis, C. Feldman and B. Feldman presented the results of their studies of dose-response of fenoterol at the American Academy of Allergy Meeting.

The Division is continuing the project: "Development and Evaluation of Self-Management Systems for Children with Asthma" under the direction of Dr. C. Feldman. More than 250 patients have been enrolled in the program which is conducted at Babies, St. Luke's-Roosevelt and Harlem Hospitals.

Drs. Welton Gersony and Constance Hayes (Division of Cardiology) together with members of the Division of Neonatology, are involved in a collaborative study of the pharmacological control of the patent ductus arteriosus in the premature infant. Babies Hospital is one of 11 centers participating in this study. Drs. Allen Hordof and Michael Rosen are continuing their investigations of the pharmacodynamics of antiarrhythmic drugs in the newborn puppy. Dr. Hordof has been selected by Searle Pharmaceutical Corporation to investigate disopyramide in pediatric patients.

Dr. Ehud Krongrad continued his research activities relating to AIDS. He also continues to investigate newer noninvasive techniques for diagnosis of children with congenital heart disease.

Drs. Sylvia Griffiths and Maureen Strafford (a postdoctoral fellow) are evaluating the long term results of surgery in patients with coarctation of the aorta. Dr. Robert Reder is studying fetal electrophysiology and the relationship between alphaadrenergic receptors and automaticity of the Purkinje fibers.

Dr. Katherine Sprint, Ms. Grace Leidy and Ms. Winifred Redman are continuing their controlled study of the effectiveness of pharyngeal bacterial flora made artificially "normal" as a host defense mechanism against infection. A collaborative relationship is being developed with the infectious disease service of the neonatal unit and Philadelphia Children's Hospital to expedite data collection.

Technologists working in the Babies Hospital Diagnostic Bacteriology laboratory have developed several new procedures for rapid and reliable diagnosis. Among the developments were a rapid screening procedure for group B streptococci by John Lawrence, who presented it at the meeting of The American Society of Microbiology, and, a micro-method for determination of minimal inhibitory concentration of antibiotics by Ellen Greenberg.

Dr. Hodes' research activities included investigations of parainfluenza virus type 3, an important respiratory pathogen in children. He produced persistent infection with this virus and implicated a viral gene product in the initiation of the persistence.

Dr. Hodes also investigated persistent infection caused by the subacute sclerosing panencephalitis variant of measles virus and implicated temperature sensitive mutants of the virus. In addition, he identified temperature sensitive mutants in a strain of ECHO virus causing chronic meningitis in an immunocompromised host.

With Dr. H.E. Bradley, Ms. Piper L. Weldy and Ms. Delores V. Espinoza, he initiated studies of the phenomenon of antibiotic tolerance in *Staphylococcus aureus*, which they showed to be mediated by a bacteriophage.

Dr. Katherine Sprunt, Ms. Grace Leidy, Dr. Hodes and Ms. Weldy continued characterization of an unique antibiotic elaborated by a commensal mouth organism.

Dr. Jane Pitt continued her research on efficacy of and immune response to pneumococcal vaccine in patients with sickle cell disease or splenectomy; eradication of group B streptococcal vaginal carriage in pregnancy; host defense function of phagocytic

cells in human breast milk and defects in phagocytic function.

The following projects are underway at St. Luke's-Roosevelt Hospital Center. A three year study of infant development was begun under the aegis of the institute for the study of Exceptional Children; it is designed to identify and evaluate potential handicapping conditions in the "at risk" infant. The Cooperative Study of the Clinical Course of Sickle Cell Disease, with Dr. Wethers as principal investigator, entered its second year. Patient recruitment has intensified and the first data are currently being compiled. Dr. Richard Mones and Victor Bokkenheuser (Microbiology) are studying viral gastroenteritis and its sequelae.

At Harlem Hospital Center, the division of Neonatology is in the early stages of developing research protocols related to the high risk infant. Research in the general areas of health care delivery has begun. Dr. Ilene Fennoy has begun basic research in the area of cellular growth.

Patient Care

In the neonatal unit a decline in occupancy rate to 78% was noted in the first four months of 1979: The rate increased to 97% for the remainder of the year. The lower occupancy rate during the first quarter was related to an unexplained drop in the admission of neonates born at Sloane Hospital. There was, however, an increase in transfers through the Perinatal Network and our infant transport system. For the remainder of the year, the number of infants born at other hospitals of the Network who were admitted to the unit has continued to increase over the previous year.

Neonatal mortality rate remains less than 10%; there was further improvement in survival of infants whose birth weight is 750–1000 grams. Now 55% of the infants live, in contrast to only 5% in 1972.

The Network has been expanded to include two hospitals in Stamford, Conn. and Morristown Memorial Hospital in New Jersey.

The role of the Division of Gastroenterology and Nutrition continues to be primarily consultative. As in the previous year, approximately five new inpatient gastroenterology and/or nutritional consultations are provided weekly. Approximately 80 upper intestinal endoscopies, 50 proctoscopies, 25 jejunal biopsies and 40 liver biopsies are performed annually. Out-patient clinic visits exceeded 250.

The Section of Nephrology continues to provide a major referral service for the diagnosis and treatment of kidney disease, hypertension, and fluid and elec-

trolyte imbalance in infants and children.

In the Division of Ambulatory Pediatrics the WIC Program has grown to include 700 enrolled mothers and children cared for by a full-time nutritionist, Mary Forsyth. A 24-hour Crisis Nursery has been funded and is being set up to treat and follow abused children and their families. The program includes a therapeutic day nursery operated in collaboration with the Departments of Obstetrics-Gynecology and Psychiatry. A formal liaison service has been established with the Division of Child Psychiatry, providing weekly consultations for housestaff Continuity Care Clinic patients.

The Division of Hematology/Oncology has currently 192 patients with a number of childhood malignancies who are enrolled in a variety of studies of the Children's Cancer Study Group. There are approximately 90 patients with sickle cell anemia who are followed in the Sickle Cell Study. Fifteen patients with Cooley's anemia are treated as part of a special clinical program by a combination of a hypertransfusion regimen and chelation therapy.

The Ambulatory facilities available to the Division of Pediatric Hematology-Oncology have been greatly improved by the opening of the new Outpatient Hematology-Oncology unit on the fifth floor of Babies Hospital North. These facilities provide examining rooms, treatment rooms and transfusion rooms in a setting of one class care to clinic and private patients. It is now possible to administer a variety of treatments ranging from transfusions to chemotherapy, without the need for excessive and frequent hospitalization. The reduction in the number of hospitalizations is particularly important in the pediatric age group.

The Pediatric Pulmonary Division is currently following 88 patients with cystic fibrosis and 170 patients with other forms of chronic respiratory disease. These patients have required 207 hospital admissions in the past year. Dr. Anthony Mansell has extended the capabilities of the pediatric pulmonary function laboratory to include provocation tests in suspected cases of hyperreactive airways disease.

The Division of Allergy recorded 4000 visits in three weekly ambulatory clinics. The residential treatment Asthma Program at St. Mary's Hospital has had an average census of 20 patients during the year. A total of 16 patients were admitted and 13 patients were discharged on referral from 12 institutions in the metropolitan area. The multidisciplinary treatment approach and active patient education program have continued.

The Division of Cardiology had 968 visits in the clinic. The affiliated Cardiac Clinic at Overlook Hospital supervised 73 patient visits. In 1978 there

were 299 cardiac surgical procedures carried out, 199 of these were open-heart procedures utilizing cardiopulmonary bypass, 21 in infants under one year of age. The pediatric cardiovascular laboratory performed 341 procedures of which 22% were in children less than six months of age. The laboratory was reapproved by the New York State Office of Health Systems Management following an extensive survey of the facility. Forty one hundred ECG's and 550 echocardiograms were carried out by the noninvasive laboratory. Two-dimensional echocardiography is now being introduced as a new diagnostic procedure. This technique is expected to facilitate the diagnosis of heart disease in children.

Dr. Arthur Bloom has been named Director of the newly formed interdepartmental Division of Clinical Genetics. Its function, already extant, but now formally acknowledged, has been provision of consultative, diagnostic, and counselling services.

In 1979, St. Luke's Hospital had 1629 admissions to the Pediatric Service, and 318 newborn infants required admission to the neonatal intensive care unit. There were 30,508 acute care visits to the Ambulatory Division. The Pediatric Outreach Home Visitor Program, lead by Dr. Elizabeth Watkins, has moved from a pilot program to a funded full-scale service for patients and parents involved in Child Maltreatment. The Pediatric Emergency Room with Dr. Fadel Hochroth in charge, is now staffed for 16 hours a day. Thus, for the most part, children are spared the frightening ambience of a busy urban Emergency Area.

The patient care activities of Harlem Hospital remained unchanged. There were 4,386 admissions in 1979 and 52,898 outpatient visits. In addition to the revision of the delivery of ambulatory care services in the hospital, the activities of the division of adolescent medicine have continued to expand. A geographically discrete adolescent ward has been established.

In March 1979 the department of Pediatrics at Harlem was awarded a grant from the New York State Department of Social Services for the initiation of a program of health education in the community schools. This program, targeted toward adolescents, provides the seed money required to identify and attempt to resolve serious health and social problems of adolescents.

The major event of 1979 at the Overlook Hospital was the groundbreaking of the first of two satellite private practice offices in pediatrics and internal medicine. All the pediatric residents will work regularly in these offices some part of each week, following the same children for a three year period.

Dr. John Gregory and Dr. Griffiths continue to

supervise the Pediatric Cardiology Clinic at Overlook. The Pediatric Endocrinology Clinic also continues to flourish under the supervision of Dr. Morishima. Plans have been formulated for a Pediatric Nephrology Clinic to be supervised by Dr. Nash.

Honors, Awards and Activities

Dr. Michael Katz was elected to the Institute of Medicine of the National Academy of Sciences. He was a consultant to the World Health Organization's Regional Office for the Eastern Mediterranean in Alexandria, Egypt, in connection with the International Year of the Child, and reviewed pediatric health problems in North Yemen. He was also a member of the United States Delegation to the World Health Assembly in Geneva and later a participant in a Symposium on Nutrition held in Warsaw, Poland. The latter marked the opening of a new child health center.

Dr. Heird was the *Journal of Pediatrics* Visiting Professor at the William Beaumont Hospital in Royal Oak, Michigan. In June he was a Visiting Professor in the Department of Pediatrics, University of Cincinnati. He was also an invited participant in the First Congress of the European Society of Parenteral and Enteral Nutrition.

Dr. Winick was elected chairman of the newly formed Section of Clinical Nutrition of the New York Academy of Medicine. He was also an invited speaker at the 11th International Summer School of Brain Research organized by the Netherlands Institute for Brain Research and at the 5th Asian and Oceanic Congress of Neurology in Manila, Philippines. In addition, Dr. Winick was invited to the International Symposium organized for the dedication of the child health center in Warsaw, Poland. Dr. Winick was a special lecturer at the Institute of Health of the Chinese Academy of Medical Sciences in Peking, China.

Dr. Pedro Rosso participated in a symposium on the role of the placenta in maternal and fetal nutrition sponsored by the American Institute of Nutrition during the annual FASEB Meeting. He was also a speaker in one of the plenary sessions of the annual meeting of the Society for Pediatric Research. In addition, Dr. Rosso was a special lecturer at the International Nutrition Course organized by the University of Nancy, France and a Visiting Professor in the Nutrition Program of the University of Puerto Rico.

Dr. Jane Pitt was elected to the Society for Pediatric Research and the Infectious Diseases Society of America. She was an invited speaker at postgraduate

courses at the University of Pittsburgh and Howard University.

Dr. David Hodes was elected to the Society for Pediatric Research and the Harvey Society. He presented his research findings at the second Basil O'Connor Research Symposium of the March of Dimes.

Dr. John Nicholson served on the CAMP NYDA Committee of the New York Diabetic Association and as advisor on diabetes for the American Field Service.

During 1979, Dr. Arthur Bloom was invited to serve on the staff of the President's Commission on the Accident at Three Mile Island. He participated in an International Course on Detection of Environmental Chemical Mutagens, in Concepcion, Chile and spent two weeks lecturing in Egypt, on the latest advances in genetics, at the invitation of Mansoura University.

Dr. William Davis was elected chairman of the Allergy Section of the New York State Medical Society. He was visiting professor at the Department of Pediatrics, Medical College of Georgia, Augusta and lectured on "Progress in Asthma Therapy." Dr. Davis also lectured at Roosevelt, St. Luke's and Harlem Hospitals and participated in American Lung Association programs in Harrisburg, Pennsylvania, Albany, N.Y. and White Plains, N.Y. He also spoke on "Nutritional Effects on Theophylline Pharmacokinetics" at Long Island College Hospital. Dr. Davis was a leader of a seminar on "Management of the Allergic Child" at the American Academy of Allergy Meeting.

Dr. Carl Steeg was elected to the Executive Committee of the Council on Cardiovascular Disease in the Young of the American Heart Association. Drs. Krongrad and Hayes were elected members-at-large of the Pediatric Cardiology Association of Greater New York. Dr. Griffiths was re-elected to the Board of Directors of the New York Heart Association.

Dr. Atwood was voted Teacher of the Year by the P&S Class of 1980.

Dr. Jerry Jacobs was a visiting scholar at Temple University in Philadelphia where he delivered a series of lectures on connective tissue disorders in children. He was elected to the Board of Directors of the New York Rheumatism Association and the Medical and Scientific Committee of the New York Arthritis Foundation and continued to serve on the Council of Pediatric Rheumatology of the American Rheumatism Association.

Dr. Gabriel G. Haddad was awarded an Edward Livingston Trudeau Fellowship of the American Lung Association for the next three years. Dr. S.

Alex Stalcup was awarded a five-year grant from the NHLBI to study the effect of arterial oxygen tension on endothelial cell functions. Dr. Richard B. Silver was named the James Alexander Miller Fellow of the New York Lung Association. Dr. Dennis Davidson was named the Milton Singer Fellow of the Department of Pediatrics.

Dr. Mellins was elected to the Fleischner Society, Dr. Mansell was elected to the Society for Pediatric Research and the American Thoracic Society. Dr. Hugh O'Bradovich was awarded a Medical Research Council fellowship of the Canadian government.

Dr. Vincent Bonagura has continued his training in immunology as the Rustin McIntosh Fellow.

Dr. Elizabeth B. Watkins (St. Luke's) was designated Chairman, Manhattan Interhospital Child Protection Agency.

Dr. Margaret Heagarty was appointed to the Pediatric Test Committee of the National Board of Medical Examiners and to the Professional and Technical Advisory Committee of the Joint Commission on Accreditation of Hospitals.

Dr. Doris Wethers presented a paper entitled "Clinical Problems and Complications" in the Howard University Center Conference on Sickle Cell Disease in the International Year of the Child.

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Pharmacology

BRIAN F. HOFFMAN

Hosack Professor and Chairman

Teaching

The Department admitted five new Ph.D. candidates, Eric Lai, Gea-Ny Tseng, Judith Goldstein, Esperanza Recio and Walter Spinelli. The last three entered as trainees of the Pharmacological Sciences Training Program. In addition, two interdisciplinary trainees, Lise Castellucci of Physiology and Gary Lattimer of Pathology, were admitted. During the year Penelope Boyden completed her pre-doctoral training and was granted the Ph.D. degree in Pharmacology. She is now a post-doctoral fellow at the Rockefeller University. Currently, 17 students are in residence as candidates for the Ph.D. degree.

Dr. S. C. Wang, Pfeiffer Professor of Pharmacology Emeritus, endowed a Fellowship Fund for graduate training in Pharmacology upon his retirement in June. Kenneth Sonnenfeld, a senior graduate student, was awarded the first Mamie and S. C. Wang Fellowship. The department received endowment to support two additional Fellowships for first-year graduate students. The Platt Fellowship was awarded to Gea-Ny Tseng and the Taub Fellowship to Eric Lai.

Drs. Kenneth Hewett and Lawrence Gessman commenced postdoctoral training in cardiac electrophysiology with Dr. M. R. Rosen. Drs. Florence Chan and Jerry I. Gliklich began postdoctoral training with Dr. B. F. Hoffman. Drs. Robert Naylor and Christine Walsh entered their second year of postdoctoral training. Dr. Yat Ong Lau completed his postdoctoral training and was appointed instructor in Biochemistry at The State University of New York, Syracuse. Drs. William Untereker, Robert Reder

and James Shapiro completed their postdoctoral training with Dr. Rosen. Dr. Untereker now is Assistant Professor of Medicine (Cardiology) at the University of Pennsylvania School of Medicine. Dr. Reder is Assistant Professor of Pediatrics (Cardiology) at the College of Physicians & Surgeons, Columbia University, and Dr. Shapiro is Assistant Professor of Pediatrics (Cardiology) at State University of New York Downstate Medical Center. Mr. Joseph Ilvento completed a year of research training with Dr. Rosen and has returned to The Johns Hopkins School of Medicine for his final year of medical school. Dr. Robert Hariman completed his postdoctoral training with Dr. Hoffman and is Assistant Chief of Cardiology at the United States Public Health Service Hospital, Staten Island.

Recipients of the annual Herbert J. Bartelstone Award were Mr. Ira M. Jacobsen of the Medical Class and Mr. Richard F. Merzer for the Dental Class. Dr. Gordon K. Moe, Research Professor of Physiology, The State University of New York College of Medicine, Syracuse, gave the H.B. Van Dyke lecture on "Can an Ectopic Pacemaker be Disquished from Reentry, and is the Distinction Important?" Dr. John A. Parsons, Head of the Laboratory for Endocrine Physiology and Pharmacology at the National Institute for Medical Research, London, was awarded the William N. Creasy Professorship in Clinical Pharmacology by the Burroughs Wellcome Fund. Dr. Parsons gave the William N. Creasy Memorial Lecture on "Advances in the Therapeutic Use of Peptide Hormones."

Dr. Katz continued his contributions to the Phar-

macology course with his lectures on Pharmacokinetics. He also began a program of instruction in biomedical applications of computing with two courses, "Introduction to Computers and Computing" and "Introduction to C-Language Programming." The research elective for medical students in the Cardiovascular Clinical Pharmacology Laboratory staffed by Drs. J. Thomas Bigger, Jr., Elsa-Grace V. Giardina, Edward B. Leahey, Jr., Robert H. Heissenbittel, Francis M. Weld and Jesse C. Davis continued to be well subscribed. Students participated in laboratory and clinical studies on the cardiovascular effects of psychoactive, antiarrhythmic and cardiotonic drugs. Dr. Kahn taught a course entitled "Pharmacotherapeutics," to postdoctoral students in the specialty program in the School of Dental and Oral Surgery. He also organized the Department's participation in the Basic Science Review Course for United States citizens attending foreign medical schools. Dr. Jeffrey has taken on the responsibility for the teaching of toxicology in the Division of Environmental Sciences and has organized a course on "Molecular and Environmental Toxicology" which covers the basic pharmacology of toxic substances. Initial plans were made to offer an Environmental Science-Toxicology Training Program jointly between Pharmacology and the Environmental Health Division of the School of Public Health. Students entering this program can choose to obtain a Ph.D. degree either in Pharmacology or in the School of Public Health. Approval has been received for the five-year renewal of the Training Program in Pharmacological Sciences which is under the direction of Dr. H. H. Wang.

Research

Dr. Andrew L. Wit and his associates continued to study the electrophysiology and pharmacology of cardiac arrhythmias caused by myocardial infarction. He collaborated with Drs. Maurits Allesie and Felix Bonke in the Department of Physiology, The University of Limburg, The Netherlands, to demonstrate that reentrant excitation is a cause of some of these arrhythmias. He and Dr. John J. Fenoglio, Jr. (Pathology) continued their investigations on the effects of ischemia on myocardial ultrastructure. Dr. Wit, Dr. Fenoglio and Dr. Penelope Boyden studied the electrophysiology and ultrastructure associated with atrial fibrillation in dogs with naturally occurring heart disease. This work was conducted in collaboration with Dr. Lawrence P. Tilley, Staff Cardiologist at the Animal Medical Center in New York City and Adjunct Assistant Professor of Pharmacology. Drs. Wit, Fenoglio and Tuan Duc Pham (Pathology) continued to study the ultrastructure of

atrial myocardium from children with congenital heart disease in collaboration with Drs. M. R. Rosen, Luc Mary-Rabine and Alan Hordorf (Pediatrics). Dr. Wit also continued his studies on "triggered" atrial arrhythmias with Drs. Paul F. Cranefield and David C. Gadsby at the Rockefeller University.

With Dr. P. S. Kulkarni (Research Associate in Ophthalmology), Dr. H. H. Wang continued to explore the mechanisms underlying the age-dependent differences in effects of several prostaglandins on the coronary vasculature by examining the metabolism of arachidonic acid by coronary vessels *in vitro*. With Dr. M. R. Blumenthal, Dr. Wang began a study of the effects of vasoactive drugs on the vascular volume of the coronary bed and Peter Mento, a graduate student in the Department, and Dr. W. H. Sawyer continued to study the role of vasopressin in regulation of arterial pressure in normal and hypertensive animals.

Dr. Sawyer continued to collaborate with Dr. Maurice Manning of the Department of Biochemistry of the Medical College of Ohio in the design and characterization of structural analogs of the neurohypophysial hormones that antagonize the vasopressor and oxytocic responses to these hormones. Antivasopressor peptides are being used, in collaboration with Mr. Peter Mento and Dr. H. H. Wang, to probe the importance of endogenous vasopressin in the maintenance of blood pressure under several physiological and pathological conditions.

Dr. Sawyer, Dr. Peter K. T. Pang, and Dr. Rosemary K. Pang have continued their studies on the evolution of cardiovascular and renal functions of neurohypophysial hormones among lungfishes and amphibians. They have developed improved radioimmunoassay methods for arginine-vasotocin that are being applied to measure circulating levels of this vasopressor-antidiuretic hormone and to determine how these change in response to various physiological stimuli. Dr. P. K. T. Pang and Dr. Sawyer also studied the effects of the parathyroid hormone and related peptides on vascular and uterine smooth muscle.

Dr. Richard Robinson, in collaboration with Drs. M. R. Rosen, John Bilezikian (Medicine) and Y. H. Lau, studied the β -adrenergic receptor of cardiac cells in tissue culture. And found that non-muscle cells present in the heart have approximately the same number of specific binding sites per cell as muscle cells, but that the receptors of the two cell types can be distinguished on the basis of their subclassification as β_1 or β_2 . Dr. Robinson also developed procedures that permit the maintenance of a high degree of electrophysiologic differentiation in cardiac monolayer

cultures. In collaboration with Dr. Marianne Legato (Medicine, Roosevelt Hospital) Dr. Robinson demonstrated that the maintained differentiation in culture extends to ultrastructural as well as electrophysiological parameters. Dr. Robinson began coculturing myocardial and nerve cells to examine the effect of *in vitro* innervation; in collaboration with Dr. Legato, he has begun an electron microscopic examination of the region of nerve and muscle junction.

In collaboration with Dr. A. Donald Finck, Dr. S.H. Ngai continued studies on the effect of nitrous oxide on the concentration of enkephalin-like substance in the whole brain in rats, using the opiate receptor binding assay, and on the mechanism of analgesic action of ketamine. Their findings support the view that ketamine induces analgesia by its direct action on the opiate receptors. While Dr. Ngai was on sabbatical leave at the Roche Institute of Molecular Biology he initiated a study on the effects of graded, acute hyposia of blood pressure, heart rate and plasma catecholamine concentrations in unanesthetized, free-moving rats.

Dr. J. Thomas Bigger, Jr., Dr. Elsa-Grace V. Giardina (Medicine) and Dr. Edward B. Leahey, Jr. continued their study of the human immunotoxicity of procainamide and its analogs and began studies of its antiarrhythmic efficacy. With Dr. Alexander H. Glassman (Psychiatry) and Dr. James M. Perel, Drs. Giardina and Bigger began a study comparing the effects of imipramine and nortriptyline on the cardiac conducting system, left ventricular function and cardiovascular reflexes in patients with severe depression. Drs. Giardina and Bigger also found imipramine to be a useful treatment for symptomatic ventricular arrhythmias in patients with heart disease. Drs. Giardina, Lynne L. Johnson (Medicine) and Bigger have begun a study to elucidate the cause of postural hypotension caused by tricyclic antidepressants. With Dr. Vincent P. Butler, Jr. (Medicine) and Dr. James A. Reiffel (Medicine), Drs. Leahey and Bigger are pursuing their studies of the digoxin-quinidine interaction. Dr. Francis M. Weld (Medicine) and Dr. Bigger studied the action of several antiarrhythmic drugs on the kinetics of the membrane sodium channel in isolated sheep Purkinje fibers. Drs. Leahey and Bigger studied a beneficial interaction between mexiletine and propranolol in patients with severe ventricular arrhythmias. Dr. Jesse C. David (Medicine) and Dr. Bigger studied the antifibrillatory properties and other electrical effects of several psychoactive drugs in animal models.

During the year Dr. Harold C. Neu studied the antimicrobial activity of new cephalosporin derivatives and of molecular modifications of existing an-

tibiotics. His investigations of β -lactamase were continued and showed that β -lactamase activity accounted for the resistance of *Legionella pneumophila* to cephalosporins. Dr. Neu delineated the normal human pharmacology of a number of new antibiotics with Dr. Gerald B. Appel (Medicine) and conducted extensive studies of the pharmacokinetic parameters of antibiotics in the presence of reduced and abnormal renal function.

Dr. Michael R. Rosen and his associates continued studies of developmental cardiac electrophysiology and pharmacology and autonomic interaction and of electrical activity in the human heart. With Drs. Mary-Rabine (Liege) Allen Hordof (Pediatrics) and Peter Danilo Jr., Dr. Rosen studied effects of α and β adrenergic agonists on automaticity of the heart of normal and small for gestational age (SGA) neonatal animals, and with the transplacental transfer of propranolol and its effect on neonatal and fetal cardiac function with Drs. T. Rosen (Pediatrics) and Sydney Spector (Roche Institute). With Drs. R. Reder (Pediatrics) and P. Danilo, Dr. Rosen has continued to study changes in ionic basis for the cardiac transmembrane potential that occur with aging. In studies of the human heart, Drs. A. Hordof (Pediatrics) and Rosen studied the actions of tetrodotoxin on the human atrial action potential and in collaboration with Drs. Charles Fisch and Suzanne Knoebel (University of Indiana) Dr. Rosen evaluated the role of delayed afterdepolarizations in the genesis of accelerated junctional escape rhythms. Dr. Rosen and Joseph Ilvento, a medical student from the Johns Hopkins Medical School studied the effects of pharmacological interactions in accelerated idioventricular rhythm.

With Mr. Gintant (graduate student) Dr. Hoffman continued studies on the mechanisms of action of local anesthetic antiarrhythmic drugs and with Dr. Naylor initiated new studies on structure-activity relationships. Dr. Hoffman and Dr. Hariman with Dr. Ehud Krongrad (Pediatrics) developed means to record the activity of the human sinoatrial node during cardiac catheterization and, with Dr. James R. Malm (Surgery) applied this method to studies on patients undergoing open-heart surgery. With Ira Jacobson, (fourth year medical student) and Susan Fox (third year medical student), Dr. Hoffman studied the anti-fibrillatory efficacy of bretylium and with Drs. Gliklich and Chan he extended his studies on the function of the *in situ* sinoatrial node of the canine heart.

Dr. Kenneth H. Dangman continued his studies on the physiology and pharmacology of abnormal automaticity on cardiac tissues and on the effects of N-acetyl procainamide on the rate and rhythm of the *in situ* canine heart. Dr. S. Roffman continued to

study the role of the acid protease leukokinin system in ascites formation in neoplastic disease. Leukikininogen, the protein precursor of leukokininogen, was purified to homogeneity from human ascites resulting from ovarian carcinoma and was shown to be related but not identical to human low molecular weight bradykininogen. Also, he began studies with mouse epidermal cell cultures to explore the roles of inflammation in chemical carcinogenesis in mouse skin, and the involvement of proteases in both carcinogenesis and psoriasis. Dr. Roffman continued his collaboration with Dr. Gerard Turino (Medicine) in studies involving the role of leukokinin formation in chronic obstructive pulmonary disease.

Dr. Jaya Haldar continued her research on the action of morphine on vasopressin and oxytocin release *in vivo* and *in vitro*. She also is continuing her investigation of the role of endogenous opioid peptides, particularly β -endorphin, in oxytocin and vasopressin release in physiological conditions as well as in stress. Together with Dr. E. Zimmerman (Neurology) Dr. Haldar is continuing investigation of the possible physiological functions of extrahypothalamic oxytocin.

Dr. Frederick G. Hofmann was awarded a grant from the Macy Foundation to search for ways to emphasize the importance of a background in humanities as one form of preparation for the study of medicine and to discover ways, if possible, for decreasing the intensity of competition among pre-medical students and for minimizing the consequences thereof.

During the year, Dr. Douglas N. Ishii continued his studies on the mechanism by which nerve growth factor can promote differentiation and neurite outgrowth in cultured rat pheochromocytoma cells. Mr. Kenneth H. Sonnenfeld (graduate student) began studying the effects of nerve growth factor on neurite outgrowth and growth rate of cultured human neuroblastoma in Dr. Ishii's laboratory. Dr. Ishii and Dr. Richard Kornbluth (Medicine) began to study the capacity of human macrophages to kill cultured neoplastic cells of neural crest origin.

Dr. Allan Jeffrey has been studying chemical carcinogens and their covalent binding to DNA.

Dr. Lou Katz has completed the design of the CPMC Tumor Registry. This large scale data base system will utilize the latest in relational database technology to store information on all malignancies seen at the Medical Center. Additional work was done on the MEDGRAF Patient Case Tracing system, with expanded graphical report options for showing the complete time course chart for patients with chronic conditions at the time of therapy decision making. In collaboration with Dr. I. Bernard

Weinstein (Public Health), Dr. Katz continued his work on computer graphic display of molecular models for instructional purposes with the making of a short computer animated movie, "The Interaction Between Carcinogens and Nucleic Acids."

Dr. Daniel Goldberg continued his research on the mechanism and regulation of fast axonal transport using single cells in the sea hare, *Aplysia*, and the marine fan worm, *Myxicola*. In collaboration with Drs. James H. Schwartz and Ludmila J. Shkolnik (Division of Neurobiology and Behavior) Dr. Goldberg described a new storage site for neurotransmitter in cells, the lipochondrion, and its possible use in the identification of neuronal transmitter type.

During the year Dr. Joseph Graziano began animal and clinical studies of 2, 3-dimercaptosuccinic acid, a new agent for the treatment of childhood lead-poisoning. Dr. Graziano also evaluated subcutaneous desferrioxamine therapy for the treatment of transfusional hemosiderosis. Currently, Dr. Graziano is working on the separation of erythrocytes by age, with a goal of providing transfusions of "young" erythrocytes to patients who are transfusion dependent (eg. those with Cooley's Anemia). Dr. Larry Crawshaw has been engaged in studies with the Department of Rehabilitation Medicine on menopausal hot flashes, nonshivering thermogenesis and exercise.

Activities

Dr. Lowell M. Greenbaum, Professor of Pharmacology and a member of the Department since 1964, left Columbia to become Chairman of the Department of Pharmacology at the Medical College of Georgia, Augusta.

During the year, Dr. Lance L. Simpson was on a leave of absence during which he conducted studies on illicit drug use and criminal behavior with the assistance of the New York City Police Department. Dr. Wu Ning, of the Chinese Academy of Medical Sciences, Peking, a participant in the Visiting Scholar Program of the Peoples Republic of China, joined the Department to study cardiac electrophysiology. Dr. Berthold Henning of the Department of Internal Medicine at Aachen was appointed Visiting Research Associate and will spend two years collaborating with Dr. Wit. Drs. Peter Pang, Adjunct Associate Professor and Rosemary Pang, Visiting Research Associate, spent two months collaborating with Dr. Sawyer in his research.

Dr. Wit lectured at the International Meeting on Sudden Death in Liege, Belgium, at the International Meeting on Angina Pectoris and Myocardial Infarction in Florence, Italy and the International Meeting

on Myocardial Infarction in Davos, Switzerland. Dr. Wit continues as Adjunct Associate Professor at the Rockefeller University and on the editorial boards of *Circulation Research* and the *American Journal of Physiology*. Dr. Sawyer was invited to speak on "Antagonists of the Antidiuretic Hormone" at a symposium on "Recent Advances in ADH Research" at Tokyo, and on "Evolution of Responses to Arginine-Vasotocin among the Vertebrates" at a Joint Seminar under the Japan-U.S. Cooperative Science Program on Biosynthesis, Secretion and Mechanism of Action of Vasopressin at Nikko, Japan. He also served on an *ad hoc* advisory committee on comparative endocrinology for the NIH-sponsored evaluation of research needs in endocrinology. Dr. H. H. Wang assumed directorship of the Graduate Training Program and continues to serve as Chairman of the Committee on Higher Degrees. Dr. Harold C. Neu served as a member of the organizing committee of the 11th International Congress of Chemotherapy in Boston and organized and spoke on β -lactamases and on the use of antimicrobial agents in special situations. Dr. Neu was co-chairman with Professor Ueda of Jikki University, Japan, of the First International Conference on Cefoperazone. He also was invited to lecture on β -lactamases and bacterial resistance at the Tenth International Microbiology Congress in Santiago, Chile. Dr. Neu continues to serve on the editorial boards of *Antimicrobial Agents and Chemotherapy*, *The Journal of Antimicrobial Chemotherapy*, *Drugs*, *The Journal of Clinical Microbiology*, *Drug Reviews*, *The American Journal of Medicine*, and *Infectious Diseases*. Dr. Michael R. Rosen continued his duties as Associate Editor of *Circulation Research* and as a member of the Board of Regents of the American College of Clinical Pharmacology; of the Cardiopulmonary Study Section of the National Heart, Lung and Blood Institute; and of the New York Heart Association Council on Professional Education. Dr. Rosen served as chairman for an international conference on Cardiac Arrhythmias and, with Dr. Miles Schwartz, was cochairman of a New York Heart Association Conference on Supraventricular Tachycardias. He also was appointed to membership on the American Heart Association-American College of Cardiology Joint Advisory Committee on Cardiovascular Drugs.

Dr. Norman Kahn was elected Vice-Chairman of the Department and continued to serve as Course Director for medical and dental student courses. He also is a member of the Curriculum Committee, the Institutional Review Board and the Advisory Board of the General Clinical Research Center. He is a member of the Editorial board of the *Journal of Dental Education*. This past year Dr. F. G. Hof-

mann was involved in the reorganization of the Institutional Review Board for the New York State Psychiatric Hospital. He continued to serve as Associate Dean for Admissions, Chairman of the Institutional Review Board and as an evaluator of applications for the Macy Foundation's Macy Faculty Scholar Awards. Dr. Douglas N. Ishii served as Seminar Coordinator for the Department. Dr. Brian F. Hoffman served as Visiting Professor to the Inter-University Institute of Cardiology in The Netherlands and lectured in Utrecht, Amsterdam, Rotterdam, Nijmegen and Maastricht. He also participated in the Fifth Workshop on Contractile Behavior of the Heart, in Antwerp. He was appointed to the Editorial Board of *Cardiovascular Pharmacology* and to the Scientific Advisory Committee of the Irma T. Hirsch Trust. Dr. Hoffman continued to serve on the Executive Committee of the Faculty Council, as Editor of *Circulation Research* and as Adjunct Professor at Rockefeller University. Dr. Graziano served as advisor to the U.S. Health Services Administration with regard to the implementation of federal assistance programs for the care of patients with Cooley's Anemia, as a member of the Medical Advisory Board of the Cooley's Anemia Foundation and the Cooley's Anemia Volunteers and as a member of an international collaborative study of a lead-mining town in Yugoslavia, organized by the Health Affairs Office of the World Bank. Dr. Graziano's role is to determine the incidence of lead-poisoning in children and to make recommendations concerning screening and treatment programs. Dr. S. H. Ngai, on sabbatical leave, delivered the First Frederick H. Van Bergen Lecture sponsored by the Department of Anesthesiology, University of Minnesota School of Medicine, and was Visiting Professor at the State University of New York, Upstate Medical Center, Syracuse, New York. He continued as a consultant to the Division of Research Grants, National Institutes of Health and as a member of the subcommittee for Continuing Medical Education, American Society for Pharmacology and Experimental Therapeutics. Dr. Lou Katz was elected President of USENIX Association, the organization of users of Computer Operating Systems produced by Bell Telephone Laboratories. These mini-computer time-sharing systems are widely used in colleges and universities, and form the basis for the computing activities at Physicians & Surgeons. Dr. Katz also served on the organization staff for SIGGRAPH-79, the annual ACM conference on computer graphics.

Dr. Kenneth Dangman was the recipient of a New York Heart Fellowship and a Research Award from the National Heart, Lung and Blood Institute. Dr. Daniel Goldberg was awarded a two year research

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Physiology

JOHN V. TAGGART

Dalton Professor and Chairman

Department of Physiology

Currently there are 14 candidates for the Ph.D. in residence; six of these are participants in the M.D.-Ph.D. program. There were 15 post-doctoral fellows and trainees engaged in research in the department during the past year. Dr. David Schachter was appointed Chairman of the Graduate Biomedical Advisory Committee and Program Director of the Columbia University M.D.-Ph.D. Program.

Dr. Eric Kandel delivered the Hazen Lecture at Mt. Sinai Hospital and the Richard O'Brien Lecture at Cornell. He was awarded the Solomon A. Berson Alumni Achievement Award by New York University and was elected president of The Society of Neuroscience. Dr. Claude Ghez was the recipient of an Irma T. Hirsch Career Scientist Award. Dr. John P. Reuben was appointed Director of the Grass Fellowship Program at the Marine Biological Laboratory. Dr. Martin Blank was elected vice president of the Bioelectrochemical Society and was a plenary speaker at the Society's meeting in Weimar (East Germany). Dr. Shu Chien was the recipient of the gold medal of the City of Nancy (France).

Research

Dr. Shu Chien and his associates in the Division of Circulatory Physiology and Biophysics have continued their studies on blood cell membranes in health and disease, the rheological factors in macromolecular transport across arterial wall, and microcirculation and blood rheology in low flow states. Kuo-Li Paul Sung, Dr. Geert W. Schmid-Schoenbein and Dr.

Chien have continued to study the effects of temperature, osmolality and pH on the viscoelastic properties of erythrocyte membranes, and the rheological findings have been correlated with changes in cell morphology studied by scanning and transmission electron microscopy and analyzed by theoretical modeling in collaboration with Professor Richard Skalak and Dr. Husnu Tozeren of the Department of Civil Engineering and Engineering Mechanics. With the use of an image holographic technique, Dr. Shunichi Usami has studied the three-dimensional geometry of individual red cells under shear deformation in a flow channel, and Dr. George B. Schuessler is developing a computational model to simulate these shape changes. Dr. Schmid-Schoenbein has completed a morphometric study on various types of leukocytes. Lanping Amy Sung and Dr. Chien have collaborated with Dr. Elvin A. Kabat (Microbiology, and Human Genetics and Development) to study the energy balance in erythrocyte aggregation by lectins. The binding of type A specific lectins to type A erythrocyte surface has been established by the use of ^3H -labeled, purified lectins, and the shearing force required to separate erythrocytes agglutinated with lectins has been determined in a flow channel. With the use of transmission electron microscopy, Amy Sung and Dr. Dean A. Handley have determined the intercellular distance and cell membrane profile in lectin-induced erythrocyte agglutinates. Dr. Handley and Jack T. Alexander have developed an apparatus for the quick freezing of specimens for electronmicroscopic examinations,

including studies on intercellular distance. Drs. Kung-ming Jan and Handley have studied the effects of lectins on the distribution of erythrocyte membrane proteins by the freeze fracture technique. Dr. Jan has established the role of surface potential enhancement in the disaggregation of erythrocytes by high concentrations of low molecular weight dextran, and he has studied the influence of sialic acid distribution on the surface potential of erythrocytes by the use of cationized ferritin marker visualized under transmission electron-microscopy. In collaboration with Dr. Alice Maniatis (Medicine, St. Luke's Hospital), Dr. Mary M.L. Lee has studied the distribution of antigenic sites on the surface of erythrocyte membrane by immunoelectromicroscopy.

Drs. Herbert H. Lipowsky and Usami have studied the role of blood cellular elements as determinants of the *in vivo* viscosity of blood in single microvessels in the cat mesentery and they have also investigated the effects of systemic hemodilution on microvascular blood flow with the aim of understanding rheological factors contributing to the maintenance of adequate oxygen delivery to tissue. Dr. Lipowsky and Mr. Alexander have developed a photodetector system for on-line measurements of red cell concentration and hemoglobin oxygen saturation. Dr. Lipowsky has conducted theoretical studies employing the techniques of electrical network analysis to simulate numerically blood flow in the microcirculation, and he has also collaborated with Dr. Myron Tannenbaum (Urology and Pathology) in studying alterations in the testicular microvasculature following systemic manipulation of hormonal balance. In an intravital microscopic study *in vivo* in the rabbit ear chamber, Dr. Schmid-Schoenbein has analyzed the hydrodynamic interaction between erythrocytes and leukocytes in capillaries and venules and established its importance in the systematic attachment of leukocytes to the venular endothelium. Dr. Syngcuk Kim has studied the influences of norepinephrine and isoproterenol on the microvessel diameter and intravascular blood flow in the rat dental pulp. He has also investigated the effects of adrenergic agents, adrenergic blockers, systemic variations in red cell concentration and arterial hypotension on pulp blood flow in the dog. Drs. Richard Chen and Foun-chung Fan (Anesthesiology), Dr. Kim and Howard Wasserman (dental student) have determined the solubility of 133_{Xe} in various tissues of the dog (including the brain, myocardium, muscle, red blood cells, plasma, hemoglobin solutions and dental pulp) at different temperatures. Drs. Fan, Chen, Kim and Shlomoh Simchon (graduate student) have studied the distribution of blood flow in various organs following

systemic alterations of red cell concentration and in several types of experimental hypotension, including hemorrhage, coronary artery occlusion, aortic occlusion and sodium nitroprusside infusion. Special attention has been given to the distribution of blood flow to the endocardium, cerebral circulation and renal circulation. Drs. Ronald D. Carlin and Jan have studied the pressure-flow relationship and oxygen utilization in the coronary circulation in response to graded occlusion of the left coronary artery. They have also investigated the influence of coronary perfusion rate on the kinetics of thallium uptake and the permeability surface area product for thallium. Dr. Simchon has developed an improved technique for the *in vivo* perfusion of the kidney. With the use of this perfusion technique as well as by controlled occlusion of the renal artery, Dr. Simchon has established the role of renal vessel dimension in regulating renin release and has determined the time constant of renin secretion rate in response to a step change in renal blood flow to be approximately 50 seconds.

Drs. Chien, Fan and Handley have continued studies on the effects of pressure changes and length oscillation on the uptake of ^{125}I -albumin by the canine arterial wall. These uptake data are correlated with ultrastructural investigations on vesicle distribution in the endothelium and time-dependent uptake of electron dense markers. These experimental data have been correlated with theoretical studies on vesicle transport done by Dr. Sheldon Weinbaum and Leslie Arminski (City University of New York). Dr. Lee has studied the influences of the level and duration of pressure elevation on the morphology of the common carotid artery. Dr. Handley has developed a technique for preparing synthetic silver colloids with controlled particle dimensions. These colloids have been used to examine molecular sieving during vesicle transport in the canine arterial endothelium. Anne L. Thurn (graduate student) has studied the effect of localized endothelial damage on the transport of macro-molecules by the wall of rabbit thoracic aorta. Dr. Usami is developing a TV scanning densitometric device for quantitating the concentration of dye-labeled protein in the aortic wall. The experimental studies on the rabbit aorta are correlated with the model developed by Dr. Robert Pfeffer (City University of New York) for predicting the concentration profile of macromolecules in the arterial wall following localized endothelial injuries. The experimental program on the arterial wall has been carried out with the collaboration and consultation of Drs. George E. Palade, Nicolae Simionescu and Maia Simionescu (Yale University) and Colin G. Caro (Imperial College of London).

The knowledge gained on blood cells and cir-

culatory dynamics has been applied to several projects of clinical investigation. The effects of controlled deoxygenation on the viscoelastic properties of blood and hemoglobin solutions obtained from sickle cell disease have been determined by Dr. Chien, Robert G. King and Dr. Athanasia Anne Kaperonis. Dr. Kaperonis has correlated these viscoelastic changes with the degree of intracellular fiber formation. Drs. Kaperonis and Handley, in collaboration with Drs. John F. Bertles, Beatrice Magdoff-Fairchild and Celia Chiu (Medicine, St. Luke's Hospital) have shown that the transition of deoxy-hemoglobin S fibers to crystals involves an initial increase in fiber diameter followed by the formation of hollow fibers. Dr. Kaperonis with Drs. Jeffrey Askanazi (Anesthesiology) and Christopher Michelsen (Surgery) has investigated blood rheology in patients who underwent total hip replacement. Drs. Allen Burke (Neurological Surgery) and Chien have studied the effects of mannitol and low molecular weight dextran on blood viscosity in neurosurgical patients. Drs. Francis Weld (Medicine) and Chien have begun a study of blood rheological changes in patients with myocardial infarction. In the Hypertension Center at Cornell Medical Center, Dr. Robert L. Letcher has continued to collaborate with Drs. John H. Laragh and Thomas Pickering in studying of blood rheology of hypertensive patients. In collaboration with Dr. Ming Neng Yeh (Obstetrics and Gynecology), Dr. Lee has studied the morphology of fetal blood vessels in human and baboon placenta. With Dr. Paul Cannon and his colleagues (Medicine) Dr. Paul H. Chen has begun to study the release of myocardial prostaglandins and catecholamines in response to rapid arterial pacing and cold pressor test in patients with ischemic heart disease. Drs. David Sackin and Jan have studied the interrelations between blood viscosity, blood volume and hemodynamic functions following acute myocardial infarction. In collaboration with Dr. James W. Correll (Neurological Surgery), Drs. Richard Chen and Chien are investigating the heart rate response in patients undergoing carotid endarterectomy to blood pressure changes induced by sodium nitroprusside infusion.

Dr. William L. Nastuk, Dr. William Niemi and Dr. Otto Plescia of Rutgers University have completed a study on rabbits made myasthenic by immunization with cholinergic receptor protein. The muscular weakness developed by these animals was found to be associated with the appearance of antireceptor antibody, a rise in serum complement activity and capacity of the serum to block transmission when passively applied to amphibian neuromuscular junctions. Dr. Nastuk with Dr. Joseph Gennaro, Jr.

and Dorothy T. Rutherford of the Department of Biology at New York University have continued electron micrographic analysis of structural changes which occur at the neuromuscular junctions of the frogs immunized with cholinergic receptor protein. Dr. Nastuk and Dr. Nuran M. Kumbaraci (postdoctoral fellow) have completed a preliminary study on tetrahydrocannabinol and have shown that this active ingredient of marijuana depresses neuromuscular transmission by diminishing release of acetylcholine. Drs. Nastuk and Kumbaraci have completed a study on the action of caffeine in causing sarcomeric oscillation in skeletal muscle and obtained evidence for the existence of a chemical intermediary which may act in excitation-contraction coupling. Dr. Nastuk and Angeles B. Ribera (graduate student) are continuing an investigation of calcium in receptor desensitization using ruthenium red to inhibit calcium sequestration. Dr. Nastuk and Mary A. Nastuk carried out a preliminary study of the catecholamine l-isoproterenol on receptor desensitization.

Dr. David Schachter and his colleagues are exploring the molecular organization and function of biological membranes. The mechanism by which vitamin D regulates the intestinal absorption of calcium is under investigation by Szloma Kowarski, who has discovered and purified a vitamin D-dependent membrane protein which binds calcium with high affinity and appears to be an integral part of the active transport mechanism for the cation. Dr. Richard E. Abbott is characterizing the protein mechanism responsible for transport of D-glucose across human erythrocyte membranes. With Patricia H. Kiyasu and Robert Sherrel, specific sulfhydryl constituents of the mechanism have been defined, including a hydrophobic sulfhydryl which appears to be required specifically for the translocation step of D-glucose transport. Michael Flamm (medical student) has demonstrated that this translocation step is sensitive to the cholesterol concentration and lipid fluidity of the microenvironment of the transport mechanism. Dr. Ellen R. Batt has shown by assays of D-glucose transport across intact human erythrocytes that the translocation step is sensitive to sulfhydryl alkylation and cholesterol modulation of the fluidity. Dr. Abbott continued a program of synthesis of impermeant sulfhydryl reagents for covalent labeling of membranes. Utilizing these, Michael Flamm is studying the effects of membrane cholesterol content and lipid fluidity on the surface exposure of the sulfhydryl groups of the major anion transport protein (Band 3) of erythrocyte membranes. Judith Resnick (graduate student) has initiated studies on the transport of choline across human erythrocyte membranes and will utilize the impermeant sulfhydryl reagents to

label and identify protein components of the mechanism. Dr. Thomas A. Brasitus and Eugenia Dziopa investigated functional interrelationships between lipids and proteins in the antipodal plasma membranes of the rat small intestinal mucosal cell. A characteristic pattern of increased lipid fluidity in the basolateral (contraluminal) as compared to the microvillus (luminal) membrane was discovered. In addition, each membrane was shown to undergo a thermotropic transition of the lipids and with this change in physical state a marked alteration in function of intrinsic membrane enzymes and transport functions. Carol J. Livingstone (graduate student) has completed studies on the lipid fluidity of rat hepatocyte plasma membranes which demonstrate a characteristic lipid thermotropic transition; calcium ion affects the lipid fluidity of these membranes by a hitherto unrecognized mechanism in which enzymatic changes in the lipid decrease the fluidity and may thereby regulate important membrane functions. Dr. Uri Cogan of the Technion-Israel Institute of Technology (Haifa, Israel) has joined the group as a visiting professor this year and contributed important studies. Impermeant fluorescent probes were synthesized and applied to the characterization of the outer hemileaflet of the human erythrocyte membrane. These probes should provide valuable information on specific lipid microenvironments which have not been characterized heretofore. In addition, Dr. Cogan has collaborated with S.B. Baruch and V.F. King (Cornell) to examine the lipid fluidity of renal cortical cell luminal and contraluminal membranes. The studies establish that the luminal membranes have distinctly lower fluidity, as noted also in intestinal mucosal cells, and suggest that the pattern may be characteristic of the lining cells of transporting epithelia.

In the Laboratory of Mammalian Neurophysiology of the Division of Neurobiology and Behavior, Dr. Claude Ghez and his associates have continued studies of the neural processes underlying the guidance of voluntary movement; these involve detailed investigation of both the kinematic and electromyographic features of tracking performance in the cat and studies of the activity of single neurons giving rise to the major descending pathways during task performance. Dr. John Martin has continued his investigations on the functional organization of the somatosensory system through an analysis of central neural interactions between multipoint stimuli presented to the skin.

Dr. James Schwartz and his colleagues in the Laboratory of Neurochemistry have continued their studies on the mechanism of axonal transport in *Aplysia* neurons in an attempt to determine the mac-

romolecules involved in the process of axonal transport. Drs. Schwartz, Beverly Lubit and Daniel Goldberg have implicated actin. Although antiactin, antitubulin and antimyosin, which presumably combine with intracellular molecules stoichiometrically, were found to be ineffective in blocking transport, a factor present in vertebrate sera which depolymerizes actin catalytically is a potent inhibitor of the transport process.

Dr. Ludmiela Shkolnik and Dr. Schwartz have examined the morphology of vesicle populations in all regions of an identified serotonergic neuron and found that while the cell body and proximal axon contain the same type of vesicle, at terminals the population of vesicles changes and three different vesicle types appear. Drs. Schwartz and Shkolnik have been studying the localization of ^3H -serotonin injected directly into the cell body of an identified serotonergic cell in the *Aplysia* cerebral ganglion, and have found a striking association of the labeled transmitter with large lysosomes.

Dr. Irving Kupfermann and his colleagues in the Laboratory of Neuropsychology have continued an analysis of the neural basis of motivational states in *Aplysia*. Dr. Klaudiusz Weiss has completed a study of the normal activity of an identified serotonergic neuron and found that its rate of firing correlates well with the arousal level of the animal. This provides good support for the hypothesis that neurons mediating arousal in invertebrates may utilize a biogenic amine as a key transmitter. Bernard Kuslansky (graduate student) has completed a study of the kinetics of satiation, utilizing a gastric balloon. Dr. Steven Rosen has found a group of mechanoreceptive sensory cells which appear to be capable of triggering swallowing movements in the animal.

Dr. John Koester in the Laboratory of Biophysics has continued his research on the cellular mechanisms of behavioral control. With Dr. Uwe Koch (post-doctoral fellow) and Dr. Weiss, he is investigating the cellular mechanisms underlying the heart rate and vasoconstrictor components of food arousal in *Aplysia*. Michael Segal (graduate student) has begun to investigate the problem of why nervous systems use such a wide variety of neurotransmitters.

In the Laboratory of Neuromorphology Dr. Craig Bailey, utilizing single and double-labeling techniques developed in collaboration with Drs. Elizabeth Thompson, Robert Hawkins, Eric Kandel and Mary Chen, described the ultrastructure and synaptic organization of identified neurons in the gill-withdrawal reflex in *Aplysia* that mediate presynaptic facilitation.

Dr. Kandel and his colleagues in the Laboratory of Neurobiology have developed a new model for syn-

aptic plasticity. Marc Klein (graduate student) has obtained direct evidence that habituation and sensitization involve a modulation of Ca^{++} influx; habituation involves an inactivation of the Ca^{++} current while sensitization involves an increase in the Ca^{++} current.

Edgar Terrell Walters (graduate student), Dr. Thomas Carew and Dr. Kandel have obtained classical avoidance conditioning in *Aplysia* and initiated an analysis of its mechanisms. Stephen Rayport (graduate student) has developed a novel system for studying the differentiation of neuronal controls of behavior using the mucus release system of *Aplysia*.

Drs. Samuel Schacher and Michele Jacob of the Laboratory of Developmental Neurobiology have studied the manner by which individual neurons in *Aplysia* differentiate their adult properties and have directed their research to answer the following questions: (1) How does the local cellular environment affect developing cells during the early stages of neuronal differentiation, and (2) when are specific cells "born" and where do they come from?

Dr. John P. Reuben and his associates have continued studies on the kinetics of contractile protein interactions and conformational changes in single intact and skinned muscle fibers employing light scattering techniques and have examined the force generating and Ca-regulating properties of normal and diseased human single fibers.

Dr. Martin Blank has continued his study of the effect of surface charge on the stability of multi-subunit macromolecules and has calculated dissociation constants of the hemoglobin tetramer. He has applied the same approach to the analysis of membrane reactions involving charged ligands and has demonstrated that cooperative effects can originate from charge-charge reactions in membranes. He has continued to develop another consequence of membrane charge, the surface compartment model, in collaboration with Esmat Mahmoud and Patrick Cavanaugh of Electronic Associates, Inc. With Drs. Karl Pfenninger and Rochelle Small (Anatomy), he has analyzed the changes in the distribution of intramembranous particles in regenerating nerve. He has also started experimental studies of changes in the properties of hemoglobin with Dr. Dean Handley, and of reactions of blood components with various surfaces together with Emily Evans (Columbia student).

Drs. Blank and Lily Soo have continued their studies of several physical properties of red cell membrane proteins in collaboration with Drs. Richard Abbott and Uri Cogan. Measurements of the rheology of ultra-thin films of these proteins have been carried out with Robert King. The surface

properties of films of the lung surfactant have been measured in a study of emphysema with Drs. Mohammed Osman and Gerard Turino (Medicine). Recently, working with Drs. Bernard Erlanger and Norbert Wasserman (Microbiology), Dr. Blank has measured the ion binding properties of cis and trans isomers of Bis Q, a compound that can be converted from one form into the other by irradiation with light of an appropriate wave length.

Dr. Raimond Emmers has recently completed a long-term study on the role of the central nervous system in regulating nutritional balance. He has described neurons in the lateral hypothalamus whose firing rate either prompts food intake or signals satiety. Changes in the firing frequencies are produced mainly by the gustatory system, not only by food in the mouth but also by substances in the circulating blood.

Dr. Michel Ferin and colleagues have continued their research on neuroendocrinology of reproductive processes in primates. One animal model used was the stalk-sectioned rhesus monkey and with Luke Vaughan, Paul Diefenback and Alan Dennison (medical students), endocrine and anatomical studies of the model were completed. This animal model was used to demonstrate direct hypophyseal effects of ovarian steroids on gonadotropin secretion and, with Dr. Andrew Frantz (Medicine) on prolactin release. The technique for hypothalamo-hypophyseal portal blood collection, perfected during the last years, was used with Dr. Peter Carmel (Neurological Surgery) to demonstrate the modulation of LH releasing factors by ovarian steroids and with Dr. Sharon Wardlaw (Medicine) to demonstrate the release of β -endorphins directly into the portal blood circulation. With Dr. John Antunes (Neurological Surgery), a study of the hormonal content and secretory activity of the *pars tuberalis*, an extension of the adenohypophysis, was completed. With Drs. Earl Zimmerman (Neurology), Carmel and Antunes, regenerative processes within the central nervous system following selective lesions of hypothalamic magnocellular pathways were studied. Also being completed with Drs. Phillip Cogen and Kenneth Louis (Neurological Surgery) are studies on the effects of anterior hypothalamic disconnection on menstrual cyclicity. With Dr. William Wehrenberg (postdoctoral fellow) and Dr. Inge Dyrenfurth, studies on photo-periodic control of gonadotropin secretion in the female rhesus monkey are in progress. With Dr. Nachman Eckstein (visiting fellow), a study on the effects of substance P on anterior pituitary secretion has been completed.

Dr. Jorge Fischbarg's studies continue to be centered on the problem of fluid transport across

epithelia. With Dr. Jacques Bourget (visiting professor from the Centre d'Energie Nucleaire, Saclay, France) he has worked on hormonal control of water permeability across urinary bladder. With Dr. Timothy Pedley (visiting scholar from the University of Cambridge) work on the theory of convection and diffusion of solutes across unstirred layers has been continued. With Dr. Jon Brodwall (visiting fellow from the University of Oslo) he has investigated the hydraulic permeability of the ciliary epithelium in the eye. With Dr. Jong J. Lim and Sheila Fischer (medical student) work has continued on a theoretical model for fluid transport. With Dr. Charles Koester and Laurentiu Costache (medical student) a technique for optical detection of changes in epithelial thickness was developed. With Dr. Larry Liebovitch (visiting fellow) and Ronald Koatz (student) previous work on the osmotic permeability of the corneal endothelium was continued.

Dr. Hugh Nellans has continued studies to elucidate the cellular and paracellular pathways of calcium transport in both rat small and large intestine as modulated by vitamin D. Isolated epithelial cell plasma

membranes are also being employed to study the transport mechanisms of calcium and sodium at both the luminal and basal epithelial cell poles. The mechanism of action of the well-known cathartic, phenolphthalein, has also been studied in rat small intestine to distinguish effects on active cellular transport processes from secondary effects on the extracellular pathway.

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Psychiatry

EDWARD J. SACHAR

Kolb Professor and Chairman • Director of Service

In September of 1979, the Department achieved the consolidation of the new Washington Heights Community Services. One hundred fifty-six lines, representing individuals working on the service, were transferred from Manhattan Psychiatric Center to Psychiatric Institute. The service, headed by Dr. Francine Cournos, now has complete programmatic and administrative responsibility for the 18-bed community ward at Psychiatric Institute, the 100-bed Washington Heights-Inwood Unit at Manhattan Psychiatric Center and the Inwood Mental Health Center. Dr. Steven Hyler became Director of the Washington-Heights-Inwood unit at Manhattan Psychiatric Center in April, when he was transferred from the Biometrics Department.

Dr. Stanley Bone became Director of the Inpatient Service at Psychiatric Institute; he was previously Director of Emergency Psychiatric Services at the Presbyterian Hospital emergency room. Dr. Jamie Nos was appointed Director of the Inwood Mental Health Center and Dr. Henry McCurtis was appointed Director of the Community Support Service (CSS) day hospital program at the Audubon Avenue Clinic.

In the Vanderbilt Clinic, Dr. Richard Weiss was named Director of the Psychiatric Emergency Room Service and Dr. Olga Diz-Pl was promoted to Director of Hispanic Psychiatric Services in the outpatient clinic.

During the year the Sexual Behavior Clinic began operating at Psychiatric Institute under the directorship of Dr. Eugene Abel. Its goals are to conduct clinical research, evaluation and treatment in the

areas of sexual deviation and sexual dysfunctions.

In June a Center for Geriatrics and Gerontology was formed, one of a cluster of centers for community health, staffed primarily by the personnel of the Department of Geriatrics Research. Dr. Barry Gurland is the Director and Drs. Ruth Bennett and David Wilder are the Deputy-directors. Dr. Leo Srole, recently retired from the Department of Social Sciences, joined the Department of Geriatrics to continue the Midtown Manhattan Longitudinal Study on mental disorders.

The Division of Community Services Evaluation, initiated in October, is headed by Carol C. Schwartz, Ph.D. This division was created to bring the mental health services research program at Psychiatric Institute into the Department of Social Psychiatry so as to facilitate greater collaboration with psychiatric epidemiology.

In the Division of Child Psychiatry, Dr. Arthur Green became Director of the Columbia Family Clinic, a sub-service which will be concerned with child abuse. Dr. Boris Rubinstein was appointed the Director of Pediatric Liaison Services, Dr. Daniel Williams became the Director of a new Pediatric Neuropsychiatry Service and Dr. Paul de Bell the Director of Family Therapy Training.

Dr. David Dunner of the Lithium Clinic and Metabolic Unit was appointed Director of Psychiatry at Harborview Medical Center in Seattle, Washington, but will continue to collaborate with Dr. Ronald Fieve of the Department of Lithium Studies in Manic-Depressives.

After an extensive search, spanning several years,

Dr. Ronald Rieder was appointed Director of Residency Training in July.

The Departments of Psychiatry in Roosevelt Hospital and St. Luke's Hospital were officially merged in October and work has begun on integrating them.

At St. Luke's Hospital, Dr. Alexander Caemerer became the Acting Director of Psychiatric Ambulatory Care; Dr. Paul Nassar was appointed Director of the Psychiatric Inpatient Service and Dr. John Rosenberger became Director of Residency Training and Medical Student Education. Dr. David MacDonald continued in his role of Acting Director of the Department of Psychiatry.

Teaching Activities

The goal of the new Director of Residency Training, Dr. Ronald Rieder, and those in the Department of Psychiatry who aid in this endeavor is to develop outstanding physician specialists in psychiatry. In the process, psychiatrists conduct, and learn, patient care, psychiatric research and the teaching of psychiatry. There are opportunities for specialization in each of these areas during the period of residency training and beyond, in fellowship status.

Psychiatry is the only department in the medical school that actively teaches in all four undergraduate years. The Department of Undergraduate Medical Education, headed by Dr. Jerrold Maxmen, prepares P & S medical students with the basic concepts, skills and information necessary for the practice of general medicine. An expanded clinical clerkship, involvement of psychiatry in teaching physical diagnosis and the procurement of a five year Comprehensive Undergraduate Training grant from NIMH have been the major achievements of the department over the past year.

During 1979 the Center for Psychoanalytic Training and Research, headed by Dr. John Weber, had an enrollment of 55 candidates in adult training and seven candidates in child analytic training. The Columbia geographical program at Emory University had an additional ten candidates. One special student was enrolled for partial training.

The clinical Psychology Internship Program, under the direction of Dr. Rachel Gittelman, was funded by NIMH.

The Department of Child Psychiatry provides training to a broad range of physicians including residents in General Psychiatry, Pediatrics and Internal Medicine. Students in Epidemiology, Nursing, Social Work, as well as psychology interns are also taught. The Child Psychiatry Fellowship Program is the key training endeavor of the department.

For the first time third-year medical students served on the General Clinical Research Service as clinical clerks.

The Washington Heights Community Service developed several important training programs during the year. Columbia University medical students now receive an important part of their third year clerkship experience in psychiatry at the Audubon Avenue Clinic and on the Washington Heights — Inwood wards of Manhattan Psychiatric Center. The amount of time they spend on the Psychiatric Institute community ward has also been expanded.

The Department of Social Psychiatry is involved in the training of epidemiologists, psychiatrists and social scientists in the NIMH sponsored Psychiatric Epidemiology Training Program. The Department of Geriatrics had given a series of lectures on geriatric issues to the students involved.

The Sexual Behavior Clinic is conducting training directly related to the three clinical research projects currently in operation. A post-doctoral student position has been funded by the grant on sexual aggression, which also sponsors a yearly national conference on the evaluation and treatment of sexual aggressives. The diabetic research project has a major commitment to instructing health care professionals on the impact that diabetes has on the patient's sexual life.

Biometrics Research, under the Directorship of Dr. Robert Spitzer, has initiated an effort at education and training in the use of the new nomenclature and the multiaxial evaluation approach by presenting, in conjunction with the American Psychiatric Association, a two day continuing medical education course entitled "DSM-III: Psychiatric Diagnosis for the 1980's."

The Consultation-Liaison Service provided assistance in organizing a new course entitled "Introduction to the Patient."

The Department of Clinical Psychopharmacology rotates senior residents from Roosevelt, Harlem, St. Luke's, Manhattan State and Bronx Lebanon Hospitals for some months exposing them to the methodological and clinical problems involved in doing clinical research.

The Roosevelt Hospital Division of Child Psychiatry, within the Department of Psychiatry, returned to full strength under the Direction of Dr. John Fogelman. He has instituted an intensive training program in child psychiatry for residents in general psychiatry and revitalized the fellowship program.

At St. Luke's Hospital and Medical Center, the medical student third-year clerkship was increased. In addition to primary responsibility in screening new patients, the students are exposed to the emergency

room, group and family therapy pharmacotherapy and brief therapy.

At Harlem Hospital, the department has also extended its teaching of third year students, expanding their experience to a full-time rotation of six weeks during which they spend time in the Adult Clinic, Liaison & Consult Service, the Emergency Room and the Inpatient Service.

Research Section

The Division of Behavioral Endocrinology, headed by Dr. Edward Sachar, supported by an NIMH program-project grant, has pursued its studies of neuroendocrine function in major depressive disorders. The abnormal hormonal responses seen in these patients illuminate their underlying hypothalamic neurotransmitter disturbances and show promise as laboratory diagnostic aids for the identification of those patients suffering biological depressions who require medication. Additionally, the Hormone Laboratory in this Division is serving as a core research facility for the Department of Psychiatry as a whole, providing analyses for research projects in the Divisions of Child Psychiatry, Therapeutics and Sexual Disorders. The linkage of the Hormone Laboratory to the Sleep Physiology Unit provides a unique facility for the study of hormonal circadian rhythms in psychiatric and developmental disorders.

The efforts of the Department of Therapeutics, headed by Dr. Donald Klein, continue to be directed at the evaluation of existing practices and the development of more effective management of psychiatric illnesses. Psychopharmacological and psychotherapeutic treatment modalities for common debilitating disorders such as depression and anxiety are being investigated. In an ongoing effort to understand the biological mechanisms underlying depressive and anxiety disorders, objective measures are being explored to produce a data-base for classifying drug effects.

In the Department of Child Psychiatry, headed by Dr. David Shaffer, research continued on Dr. Puig-Antich's study of the psychobiology and treatment of depression in children. The work has provided important new evidence concerning the relationship between serum levels of tricyclic drugs and therapeutic response. Preliminary findings from Dr. Shaffer's investigation into the relationship between neurological signs and psychiatric morbidity in adolescence suggest that neurological soft signs may serve as a predictor of psychopathology in adolescence.

The Depression Evaluation Service, headed by Dr. Frederic Quitkin, found that a group of mild

depressive patients who were referred to as endogenomorphic have a relatively high response rate to tricyclic antidepressants and a very low response rate to placebos, in contrast to "atypical" depressives, providing evidence for the validity of these diagnostic subtypes. Mianserin, a new antidepressant which has very few side effects, is also being evaluated on this research service.

The research in the Department of Clinical Psychopharmacology, headed by Dr. Alexander Glassman, has focused in three major areas: the way in which differences in drug metabolism influence response to treatment, individual differences in side effects resulting from use of common psychotropic drugs, and psychiatric and endocrine correlates of anorexia nervosa, a severe eating disorder.

The research program on the 12th floor of Neurological Institute, headed by Dr. Stuart Yudofsky, expanded when IRB approved a comprehensive prospective study to evaluate the clinical and neurobiologic effects of electroconvulsive therapy in patients with Parkinson's disease. A second study was approved to assess the effects of giving T_3 to patients who receive electroconvulsive therapy.

The Department of Neuroscience, headed by Dr. Maurice Rapport, developed new biochemical criteria applicable to the study of synaptic connections in detecting a novel model of minimal brain dysfunction in which chemical, morphological and behavioral deficits may be correlated and in showing that proteins involved in serotonin storage in platelets are very different from those having this function in the central and peripheral nervous system.

The Department of Behavioral Physiology, headed by Dr. Murray Glusman, generated evidence that, in addition to the existence of a neural system based on the opiate receptor, which mediates morphine-induced analgesia, an important endocrine mechanism exists, dependent on the anterior pituitary, which increased pain thresholds in response to stress. Vasopressin and the basal hypothalamus may also be implicated in stress-induced analgesia because Brattleboro rats (genetically defective in their ability to produce vasopressin) and rats that have sustained damage to basal hypothalamus (by the ingestion of monosodium glutamate in infancy) show an impaired analgesic response to stress.

The Division of Neurobiology and Behavior, headed by Dr. Eric Kandel, has continued its work on the mechanism of neuronal function and behavior. Dr. Kandel and his colleagues have developed a new model of synaptic plasticity. They have continued in the analysis of the neural basis of motivational states in *Aplysia* and completed a study of the normal activity of an identified serotonergic neuron, finding that

its rate of firing correlated well with the arousal level of the animal.

The Department of Clinical Psychology, headed by Dr. Rachel Gittelman, is actively involved in research in the areas of neuropsychology, outcome of childhood psychiatric disorders, and treatment evaluation.

The Sexual Behavior Clinic, headed by Dr. Eugene Abel, has three Federally funded research projects which involve both the evaluation and treatment of sexual aggressives, victims of sexual assault, and sexual dysfunctions resulting from diabetes. A fourth project, involving the evaluation and treatment of child molesters, is getting underway.

The department of Biometrics Research, headed by Dr. Robert Spitzer, continues to work primarily in the area of psychiatric diagnosis. Field trials of the drafts of DSM-III demonstrated that the reliability of the major classes of diagnostic categories is far higher using the DSM-III diagnostic criteria than has previously been reported for non-research settings using earlier diagnostic manuals. Dr. Jean Endicott, principal investigator of the NIMH Collaborative Study of the Psychobiology of Depression, has reported preliminary findings which show rates of affective illness in family members which are similar to those obtained in other studies (37%). There appear, however, to be differences in these rates between urban and rural centers. Dr. Carol Schwartz completed a socioepidemiological study of the post-discharge experiences of a cohort of 119 chronic schizophrenics in northern Manhattan.

The department of Medical Genetics, headed by Dr. John Rainer, continues to explore the ever-widening field of the interplay of genetic and environmental factors in the causation and distribution of psychiatric disorders and toxic damage to the human organism.

The department of Biological Psychiatry, headed by Dr. Jerome Jaffe, has produced data that suggests that the benefits, if any, to cigarette smokers of switching to low tar cigarettes may be far less impressive than the ten-fold reduction in tar delivery would imply.

The Epidemiology of Mental Disorders, headed by Dr. Elmer Struening, is investigating attitudes toward mental illness and mental patients, and predictors of psychiatric admissions, treatment patterns and subsequent community adjustment of patients in State psychiatric hospitals.

The Social Psychiatry Research Unit, headed by Dr. Bruce Dohrenwend, received notice of continued funding by NIMH for their grant investigating the relationship of the Psychiatric Epidemiology Research Interview (PERI) to other potential screening

instruments and to calibrate PERI and other promising scales to screen for diagnoses of schizophrenia, affective disorders, anti-social personality and other personality disorders.

A major research project completed this year by the Washington Heights Community Service, headed by Dr. Francine Cournos, was a study designed to examine the post hospital utilization of aftercare facilities by patients recently discharged from the service.

A program of clinical research is in progress at Vanderbilt Clinic, headed by Dr. Frederic Kass, with a new computerized record keeping system providing the data base.

The Department of Neuropathology, headed by Dr. Leon Roizin, identified specific alterations of CNS cellular ultrastructure in animals treated with phenothiazines, methadone and heroin.

Members of the Department of Psychophysiology, headed by Dr. Samuel Sutton, found that unmedicated as well as medicated depressive patients with a history of mania or hypomania show anomalous hemispheric lateralization suggestive of involvement of the right hemisphere in the illness.

The Department of Lithium Studies in Manic Depressives, headed by Dr. Ronald Fieve, is studying the genetics of depressive and manic-depressive disorders and the mechanism of the action of the lithium ion.

The General Clinical Research Service, headed by Dr. Lyle Rosnick, continued to function as the site of the inpatient research protocols for the Department of Behavioral Endocrinology and the Department of Therapeutics.

The Department of Communication Sciences, headed by Dr. Joseph Jaffe, found that huge individual differences in the rate of metabolism of antidepressant drugs result in a poor correlation between oral doses and blood levels, but that there is no way to predict individual rates of metabolism before actually administering the drug.

In studying the effects of alcohol intake during pregnancy, the Department of Epidemiology of Brain Disorders, headed by Dr. Zena Stein, established that the risk of spontaneous abortion is raised by even moderate intake, and that the effect of maternal drinking substantially raises the risk of expulsion of a chromosomally normal fetus.

Drs. Kornfeld, Heller and Frank of the Consultation-Liaison Service completed their study of psychiatric problems related to coronary bypass surgery. This group has recently been funded by NIH to study psychological intervention after myocardial infarction.

The Child Psychiatry Division at St. Luke's Hos-

pital is involved in research projects studying children at risk for schizophrenia and the effects of amphetamines on children's attention.

The Department of Geriatrics, headed by Dr. Barry Gurland, completed a study of the elderly in institutions in London and New York City which showed that rates of depression that severely disabled residents are much higher in these settings than was previously recognized. The Center for Geriatrics and Gerontology received a grant from the AOA to plan for the coordination of services and training in the long-term care of the elderly.

Patient Care Activities

The Child Psychiatry Out-Patient Services in Babies Hospital, under the direction of Dr. Hector Bird, has expanded its activities and an additional 2,500 square feet of space, as well as additional social workers and secretarial and administrative lines have been added to the Department, to meet a patient increases of 60% over the 1978 figures.

The hysteroid dysphoria project of the Depression Evaluation Service provided free extended psychotherapy and medication trials by experienced clinicians, and had a significant beneficial impact on the lives and functioning of most of the study subjects.

There was a significant expansion of services on all components of the Washington Heights Community Service, under the leadership of Dr. Francine Cournos. Ten new community support service (CSS) workers joined the service, thereby creating three new programs. The Presbyterian Hospital emergency room, the Audubon Avenue Clinic and Inwood Mental Health Center were each able to establish service including home visits aimed at preventing hospitalization or keeping length of hospitalization to a minimum. The Community Service now has its own pharmacist for the first time, resolving numerous logistical problems in the old system.

The Vanderbilt Clinic, under the direction of Dr. Frederic Kass, provides approximately 500 psychiatric evaluations per year, and over 600 patients are in ongoing treatment. Patients are treated in individual, group and/or family therapy and may also receive pharmacotherapy.

The Consultation-Liaison Service, under the direction of Dr. Donald Kornfeld made approximately 3,500 contacts in 1979.

At St. Luke's Hospital, the Psychiatric Service opened a halfway house for alcoholic patients, developed another on-site unit serving two hotels on Manhattan's Upper West Side and develop a Parent-Child

Center under the Auspices of the Child Psychiatry Division.

The Division of Rehabilitation at Harlem Hospital Center was expanded to serve an additional one hundred chronically psychiatrically disabled patients in a comprehensive program, funded by the State's Community Support System, bringing the total to three hundred patients served by this division. A separately funded Community Support System liaison team is working, on a part time basis, with the emergency room and in-patient service to provide placement and case management to chronically disabled patients.

Honors

Dr. Craig Bailey was awarded an Irma T. Hirsch Career Scientist Award.

Dr. Barbara S. Dohrenwend was elected to membership on the Executive Committee of the Medical Sociology Section of the American Sociological Association.

Dr. Jerry B. Finkel has been elected Secretary of the Society of Liaison Psychiatry.

Dr. Donald Hutchings was appointed Corresponding Editor of the Journal *Neurobehavioral Toxicology*.

Dr. Eric Kandel was elected President of the Society of Neuroscience. He was also elected Teacher of the Year by the second year class.

Dr. Aaron Karush was elected Professor Emeritus of Clinical Psychiatry.

Dr. Donald F. Klein received a Certificate of Commendation, APA, for services as Chairperson of the Task Force on Guidelines for Protection of Human Subjects in Psychiatric Research.

Dr. Donald Kornfeld has been appointed consultant to the Psychiatry Education Branch of NIMH. He has also been appointed as consultant to the Behavioral Medicine Branch of NIH.

Dr. Stephen Levitan has been appointed to the Board of the Society for Liaison Psychiatry.

Dr. Leon Roizin was elected Editor, *Neurobehavioral Toxicology*, Secretary & Chairman of the Program Committee, International Research Group on Neurotoxicology, World Federation of Neurology.

Dr. Elizabeth Seelig received a Mary Putnam Jacobi Fellowship for her study of volunteers for the Artificial Vision Project.

Dr. Robert L. Spitzer was awarded the Van Gieson Award for Distinguished Achievements in Psychiatry.

Dr. Elmer L. Struening was elected President of the Eastern Evaluation Research Society.

Dr. Zena Stein was awarded a Josiah Macy Foundation Senior Fellowship.

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Public Health

BERNARD CHALLENGOR

Associate Professor and Acting Chairman

The School was advised in April by the Council on Education for Public Health that it had been re-accredited for three years. Also during April the Accrediting Commission on Education for Health Services Administration re-accredited the MPH program in Health Administration and the joint MPH/MBA program. Both organizations had extensively reviewed the School at a joint site visit in November 1978.

Dr. Barbara Dohrenwend assumed the position of Head of the Division of Sociomedical Sciences while Dr. Joseph Fleiss was appointed Acting Head of the Division of Epidemiology.

Teaching

Total enrollment in the School's programs rose again in 1979 to 450 students, compared to 438 students in 1978. Enrollment of new students declined slightly however, from 257 to 250. Degrees were awarded to 139 students by the School during 1979, of which 127 were at the masters level and 12 at the doctoral level.

The Division of Biostatistics was awarded a grant by the National Institute of Mental Health for pre-and post-doctoral training in mental health statistics. The grant provides stipends and tuition support for students pursuing the Ph.D. degree in biostatistics, and has enabled the introduction into the curriculum of courses on psychometric theory, numerical taxonomy, and statistical methods in human genetics.

The biostatistics component of the School's core curriculum has been revised to provide a more sub-

stantial introductory course on statistical inference for those students planning to pursue further study of statistical methods.

Thanks to the participation of Dr. Bruce Barron (Obstetrics and Gynecology), the course on biostatistics for first year medical students was successfully revised to emphasize the role of statistical and probabilistic thinking in clinical medicine.

Mr. Ralph Ullman joined the faculty of the Division of Health Administration and will coordinate its grant from the Health Resources Administration to improve curriculum in health administration and planning, for which Dr. Samuel Wolfe is project director. Substantial curriculum revisions have begun which strengthen both single and joint degree programs of the Division.

Dr. Lois Grau also joined the faculty of the Division of Health Administration in order to add depth to the nurse administrator program funded by the W.K. Kellogg Foundation and directed by Dr. Lucie Kelly.

Dr. Itzhak Levav, Visiting Scholar from Hebrew University, Israel, joined the Division of Sociomedical Sciences for the 1979-1980 academic year. Dr. Levav is a psychiatric epidemiologist with an interest in cross-cultural research in community mental health programs. He offered a tutorial in cross-national perspectives in research problems in community mental health.

Dr. Stanley Fisher was a member of the resource faculty in Hypnosis and Biofeedback for the course on Physician-Patient Relationships given to first year medical students.

Drs. Jack Elinson and Mata Nikias introduced a new course on psychosocial factors involved in health maintenance and preventive care.

The Division of Tropical Medicine offered for the second time a continuing medical education course entitled "A Review of Parasitic Diseases." Enrollment increased considerably from the first year, and the course will be offered again in 1980.

Mr. Leslie R. Andrews, an industrial hygienist with considerable experience in both state government agencies and industry, was appointed to the faculty in the Division of Environmental Sciences. Mr. Andrews has developed and teaches a new course, Environmental Hygiene, which is concerned with the theory and techniques of measuring and monitoring parameters related to the quality of air and water. The Division also introduced a course on Legal and Regulatory Aspects of Toxic Substances. Ms. Marcia Cleveland, New York State Assistant Attorney General for Toxic Substance Control, organized and taught the course for the first time. The course on Environmental Noise Pollution was restructured under the guidance of Dr. Thomas H. Fay, Professor of Clinical Audiology and Speech Pathology. The duration of the course on Molecular Toxicology has been expanded from one quarter to two quarters to provide more extensive coverage of this subject.

Mr. Jean Cropper, an alumnus of the School and the current Deputy Commissioner of Health for Environmental Health, City of New York, returned to teach a course on Management of Environmental Problems in an Urban Center. Also, Dr. Jeanne Stellman, a noted researcher and leader in the area of occupational health, introduced a course on Toxicology and Community Health.

At the same time, existing courses have been strengthened and expanded. The most notable change was the appointment of eight teaching assistants to lead discussion sections for the Core Course on Environmental Sciences. The course was restructured to limit each formal lecture to 60-75 minutes, allowing an equal amount of time for subsequent section meetings where more personal contact between students and instructors is possible.

Two new courses were successfully introduced by the School into the medical student curriculum in 1979. For the first time at the College of Physicians and Surgeons, a required course on the Health Care System, directed by Dr. Stephen Rosenberg, was presented to first year students. Dr. Rosenberg was also course director for an elective in Medical Spanish, which was taken by over half the second year class. Its success is reflected by enrollment of over two-thirds of the students in the course to be taught in the Spring of 1980.

Research

Dr. Fleiss has conducted research into the determination of sample sizes required to detect specified differences between treatments, with special emphasis on the case of unequal sample sizes in the treatment and control groups. He has investigated the problem of the minimal sample sizes required for the Mantel-Haenszel summary chi square test to be valid. With Dr. Patrick Shrout and their doctoral students, he has studied the connections between the psychometric concepts of reliability and validity and the epidemiological concepts of sensitivity and specificity.

Dr. Robert Golden has completed the development of psychometrically sound scales for the accurate detection of health and social problems in the elderly. Especially important are the scales for detecting senile dementia and depression. He is participating in the development and testing of a brief screening interview for medical and psychological problems in the elderly.

Dr. Bruce Levin has developed LREG, an interactive computer program for the analysis of general multiple linear logistic regression problems. He has studied the problem of designing regression-like experiments when the outcome variable is binary. He has begun investigating the statistical properties of the "four-fifths rule," a screening device proposed in the federal government's Equal Employment Opportunity Commission's guidelines for fair employment practice. With Dr. Shrout, he has completed a comprehensive extension of logistic regression models to complex surveys and experiments.

Dr. Sylvan Wallenstein has constructed a set of tables that can be used to ascertain the statistical significance of an apparent clustering of health events in time, with applications to monitoring and surveillance over time. With Dr. Agnes Berger, he has completed a comparative analysis of two statistical procedures for comparing several proportions estimated from matched samples, and has derived a method for determining optimal sample sizes.

Ms. Molly Park has taken responsibility for the processing and analysis of data from a collaborative U.S.-U.S.S.R. clinical trial of penicillamine for the treatment of severe arthritis. She is participating with researchers in the School of Dental and Oral Surgery in a comparative study of caries resistant and caries susceptible subjects.

Ms. Livia Turgeon directs the processing and analysis of data from a study of the effects of maternal use of drugs such as methadone during pregnancy on neonatal and early childhood development. She also directs the analysis of data from a study seeking to identify patterns of compliance with home care regimens prescribed by dentists, and to measure the rela-

tionship between compliance and various indicators of dental and oral disease.

Dr. Shrout has worked on improved procedures for the quantitative scaling of stressful life events, so that association between stress and the onset of illness may be studied more precisely. With members of the Division of Epidemiology's Social Psychiatry Research Unit, he has applied multiple discriminant analysis to develop a psychiatric screening measure. With members of the Sergievsky Center, he has studied risk factors—particularly the use of alcohol and tobacco—in spontaneous abortion.

Dr. Berger has completed research into optimal tests for partial association in complex cross-classification tables. With members of the Cancer Center/Institute of Cancer Research, she has studied Anti-MMTV antibody levels in a strain of tumor-resistant mice. With members of the Department of Ophthalmology, she has begun studies of the vaporization of intraocular tumors by radiation with a carbon dioxide laser.

Dr. I. Bernard Weinstein and his associates have continued their studies on the molecular and cellular mechanisms of action of chemical carcinogens. Studies done together with Dr. Dezider Grunberger and Dr. Alan M. Jeffrey have focused on the structural and functional changes in DNA when it is modified by the ubiquitous environmental carcinogen benzo(a)pyrene (BP). Cell culture studies on the mechanisms of action of the phorbol ester tumor promoters have provided evidence that they: 1) induce phenotypic changes that mimic those seen in tumor cells, 2) are potent modulators of differentiation, 3) alter the function of cell surface receptors for growth factors, and 4) enhance the transformation of cells by oncogenic viruses. These results provide insights into multifactor interactions and multiple steps in the action of environmental carcinogens.

Dr. Grunberger and his coworkers have determined that when appropriate microsomal activation enzymes are used in a *Salmonella typhimurium* mutagenesis assay system the DNA-BP diol epoxide adducts formed resemble that seen in intact mammalian cells. The demonstration that alkylated pyrimidines, products of carcinogens acting on nucleic acids, have changed base pairing properties which are considered to be mutagenic has been studied in collaboration with Dr. Bea Singer from the University of California, Berkeley. In collaboration with Dr. Robert P.P. Fuchs (CNRS, Strasbourg, France) the mutagenicity of 7-iodo and 7-fluoro derivatives of N-2-acetylaminofluorene was investigated. In collaboration with Dr. Dean Englehardt (Microbiology) evidence has been provided that lysine is involved in the biosynthesis of the hypermodified Y base in phenylalanine tRNA of Vero cells.

Dr. Jeffrey has been studying the covalent binding of chemical carcinogens to DNA. Some classes of chemical carcinogens such as the polycyclic aromatic hydrocarbons, of which BP is an example, require metabolic activation before this can occur. Recent studies have concentrated on the way in which DNA binding occurs for BP in both human tissues and a variety of animal systems by investigating the chemistry of the adducts. The significance of this work is that many test systems for human chemical carcinogens are based on animal data and *in vitro* tests. We must insure that we look at the best possible model. Understanding the detailed chemistry of these modifications to DNA and the effects which they have, will enable a better understanding of the way in which chemicals induce cancer in man.

Drs. Lillian Belmont, Patricia Cohen, and Zena Stein are studying the intellectual and behavioral status of children born to adolescent mothers. Maternal age was related to intelligence and achievement test scores of the offspring even after relevant social and demographic variables were controlled.

Dr. Mary Curnen has completed an analysis of data collected for the study of cancer in physicians compared to lawyers. Cancer mortality among physicians tended to be higher than among comparable groups of lawyers.

Dr. Bruce Dohrenwend has continued to make good progress in both his substantive and methodological research in the Social Psychiatry Research Unit over the past year. The pilot stage of a study of stress and psychopathology in collaboration with Dr. Barbara Dohrenwend and researchers at the Hadassah Medical School in Israel has been successfully completed and formed the basis of a four-year renewal application to conduct this major epidemiological investigation in Israel. The renewal application submitted for their program of methodological research has been approved and funded and a major new field operation will soon be underway as part of this productive series of investigations of the important problem of case identification and diagnosis in the general population.

Dr. Frances Gearing continued her research into the epidemiology of substance abuse, and developed rigorous criteria for the evaluation of intervention programs.

Dr. Inge Goldstein was awarded a grant from the National Heart, Lung, and Blood Institute to develop models for predicting asthma epidemics in time and in location. Components to the research program include finding reliable procedures for identifying such epidemics, examining long term trends in asthma, and identifying environmental and meteorological factors associated with the epidemics.

Ms. Ann Goodman completed a prevalence study

of inpatient mental illness in Rockland County, N.Y. Prevalence rates for alcoholism, schizophrenia, and affective disorders have been separately determined and compared to each other controlling for age, sex, ethnicity, social class, and ecologic variables. The major focus of the study has been on those factors correlated with severe alcoholism.

Dr. Nigel Paneth's work continues in the area of neonatal intensive care and its effects in populations. His study of mortality and intensive care sponsored by the National Institute of Child Health and Human Development is entering its second year. His small study of temporal clustering in congenital heart disease is drawing to a close.

Dr. David Rush was awarded a grant from the National Institute of Child Health and Human Development to study the association between maternal smoking, nutrition, and social class on the one hand and the physical and psychological development of the offspring on the other. This study utilizes data collected by the Prenatal Project, a controlled randomized trial of nutritional supplementation in pregnancy conducted in a deprived community in New York City. Dr. Rush was awarded another grant from the same Institute to study the long-term effects of maternal cigarette smoking on child development. This study is being conducted on a large representative cohort of children born in Great Britain in 1970. Under Dr. Rush's direction, a new Developmental Epidemiology Research Unit was created.

Dr. Stephen Shafer continues to work in collaboration with a team headed by Dr. David Shaffer (Psychiatry) on a retrospective cohort study of children from the Columbia chapter of the Collaborative Perinatal Project who had minor neurological dysfunction ten years ago at age 7. Dr. Shafer consults with Drs. Lewis Rowland and Marcello Olarte (Neurology) on their clinical trial of levamisole in amyotrophic lateral sclerosis. He also works with Dr. Paul King from the Department of Geography on spatial analysis of cancer rates.

Following several years of developmental work, Drs. Cohen and Elmer Struening and their staff are expanding their small area studies to include observations on the populations of census tracts, health areas or minor civil divisions comprising the 63 counties of New York State. This work requires the parallel development of computer technology and the design and completion of demographic and social epidemiological studies. The former involves the development of computer graphics software which facilitates the presentation of characteristics of small area populations on computer drawn maps. The social epidemiological and demographic studies focus on the identification of attributes of area populations

which are associated with variation in rates of morbidity, mortality and mental health parameters and which predict rates of use of health and mental health services. Of particular interest are patterns and dimensions of change from 1970 to 1980 over small areas of New York State and the association of these changes with changes in the health and mental health status of small area populations. It is already clear that powerful links exist between characteristics of small area populations, their health status and their selective use of health facilities. The description and determinants of selective population shifts from area to area, related in particular to available housing, ethnic composition and economic conditions, are of particular relevance to those responsible for the planning, rendering and evaluation of health and mental health services.

Dr. Wolf Szmuness has been selected by the National Institutes of Health to prepare, design and implement the first clinical trials to evaluate the efficacy of a vaccine against hepatitis B. The first trial, in over 1000 homosexual men from New York City, was initiated in November 1978, and the required sample size achieved in November 1979. Another trial in over 2000 patients under maintenance hemodialysis and medical staff at 40 dialysis centers across the country was initiated in November 1979. A third trial is being prepared in endemic areas in South East Asia and Africa.

Drs. Zena Stein, Jennie Kline, Mervyn Susser and Dorothy Warburton are continuing their studies of the epidemiology of spontaneous abortion and fetal defect with new funding from the National Institute of Child Health and Human Development and the National Institute of Drug Abuse. In this combined epidemiologic, cytogenetic and pathologic study of spontaneous abortions they will examine the relations of smoking, oral contraceptive use and exposure to common household products to spontaneous abortion and the karyotypic and pathologic characteristics of the abortus. Analyses of data previously collected from three Manhattan hospitals showed an association of smoking with the spontaneous abortion of chromosomally normal conceptions. The data suggest that this association may be concentrated among women who used oral contraceptives prior to the study pregnancy. In their newly funded study they will collect further data from the same three hospitals in order to examine more fully the possible interaction of smoking and oral contraceptive use, and to describe the morphologic characteristics of abortuses of smokers. In addition, changes in both the frequency of spontaneous abortion and of chromosomal and morphologic anomaly are monitored in order to test the feasibility of surveillance of spontaneous

abortions to detect the introduction of factors that interfere with reproduction.

Drs. Stein, Kline, Susser and Warburton will also examine the relations of maternal and paternal alcohol use and drug use (tranquilizers, marijuana, heroin, barbiturates and other medications) to spontaneous abortion and the cytogenetic and morphologic characteristics of the aborted conceptus. Interview data on exposures to these substances are being collected in three New York City hospitals from women experiencing spontaneous abortion and women delivering after 28 weeks' gestation (controls). Analyses of data collected in their previous study on the epidemiology of spontaneous abortion and fetal defect indicated an association between maternal alcohol consumption during pregnancy and the spontaneous abortion of chromosomally normal conceptions. In this study they will attempt to describe in more detail the type of maternal drinking which is associated with spontaneous abortion and to explore the relation of several other substances to spontaneous abortion. In addition, they hope to distinguish the effects of maternal alcohol and drug consumption from those of paternal consumption.

Dr. Fred Goldman began a major study of the medical care costs of drug abuse, funded by the National Institute of Drug Abuse, and was joined in the project by Dr. Judith Richman.

Dr. Bruce Vladeck and Mr. Robert Rosenblum completed their study of the out-of-pocket costs of health care for the elderly. This work was funded by the Burden Foundation. A policy analysis was developed from these data by Dr. Wolfe and Miss Willine Carr.

The contract for technical services and associated working papers developed by the Division of Health Administration for the Health Systems Agency of New York City was successfully concluded.

Dr. Giorgio Solimano is one of the principal investigators in a new project funded by the Office of Nutrition at USAID to study trends and determinants of infant feeding practices, especially breastfeeding, in developing countries. This will include an analysis of the role of the health infrastructure, marketing of infant formulas and technical assistance for program and policy development. The project will be carried out by a consortium composed of the School, Cornell University and The Population Council. Dr. Solimano also is currently developing an international collaborative project to study the relationship of government interventions in health, nutrition, population and social service to trends in infant mortality in three Latin American cities. Dr. Carlos Montero, a Post-Doctoral Fellow, and Regina McNamara, doctoral student, are assisting on the development of the project.

The Social Science Research Unit of the Division of Population and Family Health, staffed by Drs. Susan Gustavus Philliber, Pearla Brickner Rothenberg and Katherine Darabi, conducts evaluative as well as more general research. Projects underway during 1979 included: a study of the contraceptive use patterns of teenagers before and after induced pregnancy termination, and the effects of counseling; an intensive study of the impact of sex education on student, parents, and faculty in a Virginia school; and a study of the effect of maternal age on the parenting behavior of almost 300 women who delivered their first child at the Hospital during 1975. The unit is also beginning to participate in international research on adolescents.

The Center for Socio-Cultural Research on Drug Use continued its research on epidemiological, psychosocial and policy aspects of drug use.

Dr. Eric Josephson is currently engaged in a study of drug policy-making at the state and federal levels in the United States and Britain, with particular reference to the forces promoting and resisting change in policy regarding marijuana.

Dr. Denise Kandel has three ongoing research projects: a pilot study on drug use among women in which the relationship between the use of various legal and illegal drugs and psychosocial factors, particularly sex roles, are being investigated; a cross-cultural study of the psychosocial factors related to adolescent use of cigarettes, alcohol and marijuana among French and Israeli adolescents; a study of the psychosocial aspects of drug use in young adulthood based on a follow-up of young adults who eight years earlier had participated in a study of drug use among adolescents.

Dr. Ann Brunswick continues her work at the Center on health and drug use among black youths. She also received an award from the William T. Grant Foundation to prepare a comprehensive monograph based on her longitudinal study of urban black males and females. This work will broaden the informational base on adolescents and adolescent health.

Mr. Paul Haberman initiated field work and began data analysis on the study of use of health services by American merchant seamen in collaboration with the United States Public Health Service Hospital on Staten Island. He also undertook the analysis of life history data from a study supported by the Smithers Treatment Center at Roosevelt Hospital. The research subjects were recovered alcoholics in high status occupations, including medical and health professional groups.

Dr. Mata Nikias is analyzing data obtained from her study of patient compliance in preventive dentistry. Psychosocial and programmatic factors affect-

ing long-term compliance with a preventive care regimen are being examined among both private and clinic patient groups.

Ms. Corinne Kirchner initiated a policy analysis of coverage for low-vision services. She also completed a report of a study of social factors affecting careers in science for blind and visually handicapped persons.

Based on its analysis of unmet and undermet health needs in the Harlem Community, the Department of Patient Care and Program Evaluation at Harlem Hospital Center, directed by Mr. Morton Siegel, assisted in the development of outreach programs in breast cancer, geriatrics, and ophthalmology and in the development of health networks under the Federal government's Urban Health Initiative Program.

Dr. Jack Elinson and Ms. Athilia Siegmman are evaluating an experimental insurance program in which physicians are paid on a capitation basis for the provision of primary ambulatory care in their private offices. The study team is assessing behavioral impacts on the physicians and consumers enrolled in the plan.

Dr. John Colombotos and Ms. Corinne Kirchner continued the data analysis and preparation of a monograph reporting the results of research on physicians' attitudes toward political and health care issues. Dr. Colombotos is conducting a comparative study of the power and influence of the medical profession in Greece and the United States while on sabbatical leave in Greece. This work is supported by a Senior International Fellowship from the John E. Fogarty International Center for Advanced Study in the Health Sciences (NIH).

Dr. Sally Guttman gathered a multidisciplinary research team to investigate value and ethical conflicts that arise from the application of one of medicine's most pervasive and advanced technologies, chemical intervention, to one of the nation's most prevalent and medically ambiguous chronic conditions, borderline hypertension.

Dr. Dickson D. Despommier continued his studies of host immunity to *Trichinella spiralis*, a common nematode parasite of man that causes trichinellosis, a disease with a worldwide distribution. The general components of the protective immune response in experimental animals have been partially identified, and a few protective antigens have been isolated from the parasite in highly purified form. This work continues to be supported by an N.I.H. grant.

Drs. Philip A. D'Alesandro and Suzanne Holmes are continuing their studies of immunity in trypanosomiasis, using *Trypanosoma lewisi* of the rat as a model. A unique reproduction-inhibiting humoral immunity is developed against this parasite, and the antibody, an IgG immunoglobulin, has been

isolated from the surface of the parasites in very pure form. This work continues to be supported by an N.I.H. grant that was renewed for three years.

Dr. John D. Frame continued his research on the epidemiology of Lassa fever in West Africa through periodic field trips to Liberia. With support provided by a recent contract from the U.S. Army Medical Research and Development Command, immune plasma will be collected in Liberia for investigations into its protective qualities and for the protection of investigators working on this disease.

Dr. Roger W. Williams continued his studies on characterization of a chemical messenger, or pheromone, that regulates the mating behavior of mosquitoes and has identified anatomical changes that accompany exposure to the pheromone.

Dr. D'Alesandro was also awarded an N.I.H. grant to initiate a collaborative study between scientists at the Medical Center and at the Federal University of Rio de Janeiro in Brazil to investigate immunological aspects of visceral leishmaniasis, a serious and usually fatal disease of the tropics and subtropics. This project is part of a new program at N.I.H. designed to initiate and encourage greater research efforts abroad in tropical diseases.

Dr. Stephen Rosenberg and a group of medical students have been investigating the epidemiology of complications of labor and delivery among previously healthy women, utilizing a computer analysis of 240,000 birth records prepared by the New York City Department of Health and partially funded by The National Foundation—March of Dimes.

Service and Honors

Dr. Fleiss has been appointed to the editorial board of the *American Journal of Public Health*, and to the study section on epidemiology and service delivery of the National Institute of Mental Health.

Dr. Weinstein was appointed to the National Committee on Cancer Prevention and Detection of the American Cancer Society, the Mott Prize Committee of the General Motors Cancer Research Foundations, the Board of Scientific Counselors of the Division of Cancer Cause and Prevention of the National Cancer Institute, the Scientific Advisory Committee of the Northwestern University Cancer Center, the Advisory Board of the Chemical Industries Institute of Toxicology, the Advisory Board of the Banbury Center of the Cold Spring Harbor Laboratory, and the External Scientific Review Committee of the Imperial Cancer Research Fund in London. He served as chairman of the 1979 Gordon Cancer Conference and presented invited lectures at the Princess Takamatsu Symposium on Cancer Research

in Tokyo and the International Conference on Environmental Carcinogens in Amsterdam.

The Division of Environmental Sciences continued to contribute to national and international activities to enhance environmental health. Dr. Granville H. Sewell visited the Republic of China (Taiwan) as a guest of their National Science Council to advise on the structuring of new program to regulate toxic substances in the environment. As a consequence of his report, the Ministry of Health has been expanded to include an Environmental Protection Administration and two new laboratories are being organized, one for the identification and measurement of toxic substances in the environment and the other for performing screening tests of workers to detect possible hazardous conditions in work places.

Dr. Sewell and Dr. Andrew Spielman, a professor from the Harvard University School of Public Health, visited Sri Lanka to advise the government on preventive health measures to protect settlers in a large new irrigation project that will eventually involve moving about 10% of the nation's population. Strong recommendations were made for the improvement of water supplies and the reorganization of the malaria control program.

Dr. Rush was elected President-Elect of the Society for Epidemiologic Research. He was appointed to the advisory committee for the U.S. Department of Agriculture's Food and Nutrition Service for the evaluation of school nutrition programs.

Dr. Struening was elected President of the Eastern Evaluation Research Society.

Dr. Bruce Dohrenwend was appointed Chief of the new Department of Social Psychiatry at the New York Psychiatric Institute. He was chosen to head the Task Group on Behavioral Effects for the President's Commission on the Accident at Three Mile Island. He also became a member of a committee formed by the Institute of Medicine of the National Academy of Sciences to study "Research on Stress in Health and Disease."

Dr. Zena Stein was awarded a Josiah Macy Scholarship.

Dr. Wolfe became President of the Public Health Association of New York City. He and Prof. Michael Ziegler served as consultants to the Center for Law and Social Policy in Washington.

Dr. Lowell Bellin chaired the NYC Emergency Medical Services Council.

Dr. Vladeck went on leave to serve as Assistant Commissioner of Health for New Jersey, and Prof. Marcia Pinkett-Heller went on leave to serve as Executive Director of the New York State Commission on Health Education and Illness Prevention.

The Division of Population and Family Health, in

conjunction with the Obstetrics and Gynecology Service of Presbyterian Hospital, is in the process of developing a broad range of health and educational programs to address important health and social needs of the people in Washington Heights. Reproductive health and counseling services for adolescents, an innovative program headed by Ms. Judith Jones, is a key part of the Division's activities. The Young Adult Clinic now has two evening sessions a week, and had 6,000 patient visits in just over two years of operation. The Sloane Evening Clinic (the first evening clinic providing services for adult women in the Hospital's history) began in May, and is providing prenatal, family planning, gynecological and counseling services for both adolescent and adult women on an appointment basis. This pilot program has now been adopted by the Hospital as an integral part of its services for the community.

While important services are being provided for some adolescents, it is evident from the rates of teenage pregnancy and related health problems in the community that increased preventive services are urgently needed. The Division, in cooperation with other departments, is developing a Comprehensive Adolescent Health Care Program to meet a wide range of medical and social service needs of this often-neglected group. In order to reach these young people, the Center, through its Health Education Unit, has embarked on an intensive community education program using such tools as a mobile health van, films and flyers, a community health fair.

The Division is working to improve the lives of poor people by responding to requests from governments and private associations in developing nations for technical assistance in the organization, implementation, and evaluation of new and improved approaches to family planning and related health services. Their current activities are described below.

Dr. Henry Elkins continued his technical assistance to the Bangladesh Social Marketing Service on the assessment of social marketing activities, and to the Dacca University Institute of Statistics and Research Training and the Bangladesh Family Planning Association on studies of contraceptive use and traditional rural healers. Dr. Christina Brinkley-Carter and Ms. Joanne Revson completed a case study of the Concerned Women for Family Planning project.

Dr. James Foreit has joined the staff of the Division and will be assigned to Brazil, where he will assist the private family planning association, BE-MFAM, in designing a state level social marketing experiment and an integrated contraceptive distribution/parasite control program, and in evaluating the expansion of community-based distribution programs. Drs. John Ross and Martin Gorosh pro-

vided assistance to BEMFAM and to CPAIMC, a maternal and child health agency, on the evaluation of an integrated maternal and child health and family planning program involving a hospital-based postpartum family planning service and outreach program.

Mr. Stephen Isaacs and Drs. Henry Elkins and Jane Bertrand continued technical assistance to AP-ROFAM, the private family planning association in Guatemala, for the completion of two experiments in contraceptive distribution to agricultural workers and their families.

Dr. James Allman replaced Dr. Robert Hannenberg as the Division's resident advisor to the Ministry of Health. Dr. Allman and Ms. Revson have continued assistance to the pilot program of household distribution of contraceptives and simple medications by specially trained local residents in villages.

Drs. Allan Rosenfield, John Ross, and William Van Wie served on UNFPA missions for needs assessment and project development for the UNFPA family planning service projects in Indonesia.

Mr. Isaacs, Ms. Michele Shedlin, and Dr. Elkins have continued to render technical assistance to the Ministry of Health of Mexico in program implementation and evaluation of a large-scale project designed to bring maternal-child health and family planning services to the rural poor and urban slum dwellers.

Ms. Jones consulted with staff of the Adolescent Sex Education and Contraceptive Program of the Children's Hospital of Mexico.

Drs. Walter Watson and Nicholas Cunningham and Ms. Revson consulted with staff of the Department of Obstetrics and Gynecology of the University of Ibadan in Nigeria on the development of an integrated village-based family planning and maternal/child health demonstration project, with services delivered by traditional birth attendants, other specially-trained community agencies, community agents and government midwives.

Dr. Walter Torres has been assigned as resident advisor to the Peruvian Ministry of Health, and Dr. Elkins and Mr. Isaacs provided short-term assistance in the development and evaluation of an integrated health/nutrition/family planning project involving delivery by 1700 village agents in the Mid-South Health Region.

Mr. Anthony Bennett is continuing as resident research advisor in Thailand where he works with the Research and Evaluation Unit of the National Family Planning Program. He also assists the Mahidol University School of Public Health and the Community Based Family Planning Service (CBFPS) in evaluation of their family planning activities, and he helped in the preparation and initiation of an international training course in community-based distribution of

contraceptives at the Asian training center of the CBFPS.

Dr. Brinkley-Carter and Ms. Revson completed a case study of the Nurse's Association of Thailand.

Drs. Van Wie, Watson, Elkins, and John Ross consulted with personnel of the Family Planning Association of Sri Lanka on the design of an experimental social marketing contraceptive service project.

Drs. Watson, Giorgio Solimano and Donald Lauro assisted personnel from the Department of Community Medicine of the University of Khartoum and the Sudanese Ministry of Social Affairs in the Development of an integrated community-based distribution demonstration project.

Dr. Barbara Dohrenwend served on the Task Group on Behavioral Effects of the President's Commission on the Accident at Three Mile Island. The group studied the impact of the event on the mental health of community residents and workers at the plant and submitted a technical report on the findings to the Commission. Dr. Dohrenwend was elected to membership on the Executive Committee of the Medical Sociology Section of the American Sociological Association. She was also elected to represent the Division of Community Psychology in the Council of the American Psychological Association.

Dr. Elinson consulted to the National Center for Health Statistics on a national study of the consequences of certain life styles—in particular, preventive health behavior and personal social support systems—on health status and use of health care. He is a member of a study group of the Institute of Medicine formed to advise the President's Office of Science and Technology on issues arising from the conduct of clinical investigations in developing countries.

Dr. Sally Guttmacher chaired the American Public Health Association Task Force on Latin American Health Workers. She was also an invited participant to the Seminar on Political Economic Determinants of Malnutrition, University of Oslo, Norway.

Dr. Kandel received the Pacesetter Award from the National Institute on Drug Abuse for her contribution to the understanding of factors determining drug use behavior, and the identification of sequences and stages of drug use and abuse.

Dr. Mata Nikias chaired the Committee on Socio-Dental Indicators of the International Association of Dental Research, appointed at the request of the World Health Organization. The committee submitted a report to WHO on the potential of research to conceptualize and operationalize psychological, social and economic measures to assess the

impact of oral conditions on populations and individuals. Dr. Nikias participated in an invitational Conference on ethical and legal considerations in dental caries research involving human subjects at the University of Iowa.

Dr. Brunswick chaired the program committee for the Conference on Social Sciences in Health, American Public Health Association. She also was an invited participant to the Conference on Smoking and Behavior at the Institute of Medicine.

Ms. Siegmann was co-program chairperson for the Conference on Social Sciences in Health presentations at the annual meeting of the American Public Health Association. She also arranged the CSSH invitational session, Health Services Research: An Analytic Assessment with Implications for Social Sciences.

Ms. Kirchner organized and presided over the Needs Assessment Research Session at the annual meeting of the American Association for Public Opinion Research. She served as a member of the Committee on Government Statistics of the American Sociological Association and co-led two discussion sessions at the ASA annual meeting on The Sociologists' Stake in the 1985 Mid-decade Census. She was also interviewed for two radio programs on research about employment status of visually handicapped persons.

Dr. Rosenfield was elected Chairperson of the National Medical Committee, Planned Parenthood Federation of America. He was also elected to the Executive Committee and Board of Planned Parenthood Federation of America, the Board of The Alan Guttmacher Institute, the Board of the National Abortion Federation, the Medical Advisory Committee, New York Chapter, National Foundation (March of Dimes), and the Committee on Maternal Welfare of the Medical Society of New York County.

Dr. Philliber was elected to the Board of Directors of the Population Association of America and to the Board of Directors, Planned Parenthood of Rockland County, New York.

Ms. Jones served on the American Public Health Association's Adolescent Health Task Force and the National Abortion Federation's Task Force on Minors.

Dr. Henry Elkins served on the Executive Committee of the International Committee on Applied Research in population—Latin America (ICAR-PAL).

Ms. Joanne Revson served as a member of the Steering Committee, Working Group on International Women's Programs.

Dr. Pearila Brickner Rothenberg served as Evalu-

ation Consultant to the Door—A Center of Alternatives.

Dr. Katherine Darabi served on the International Planned Parenthood Task Force on Adolescents.

Dr. Giorgio R. Solimano was appointed to the Advisory Board of the Nutrition and Preventive Medicine Task Force, American Medical Association and was consultant on the project entitled "Estilos de Desarrollo y Medio Ambiente en America Latina," sponsored by the Economic Commission for Latin America of the United States.

Ms. Kathryn Spreet was Membership Secretary of the Association for Population/Family Planning (APLIC) Libraries, of the Information Centers—International, and a member of the International Activities Committee of APLIC—International.

Ms. Susan Pasquariella was a member of the Research Forums Committee of the Library Research Round Table American Library Association. She also served on the Board of Directors of APLIC—International.

Dr. Despommier was elected President of the New York Society of Tropical Medicine.

Dr. Frame was appointed Treasurer and Member of the Executive Committee, National Council for International Health, Washington, D.C.

Dr. D'Alesandro was appointed to the editorial board of *Zeitschrift für Parasitenkunde* and was Chairman of the Craig Lectureship and Soper Lectureship Committees of the American Society of Tropical Medicine and Hygiene.

Donors

Agency for International Development, American Foundation for the Blind, Inc., Association of University Programs in Health Administration, Florence W. Burden Foundation, Family Planning International Assistance, Ford Foundation, General Services Foundation, Health Systems Agency of New York City, Hewlett Foundation, Hospital Service Plan of New Jersey, Institute for Prepayment Studies, Inc., W.K. Kellogg Foundation, McGraw Hill, Mellon Foundation, Charles Stewart Mott Foundation, The National Foundation, National Sciences Foundation, Jesse Smith Noyes Foundation, Population Council—ICARP, Population Crisis Committee, Auxiliary of Presbyterian Hospital, Prospect Hill Foundation, Rockefeller Foundation, Siam Institute for Mathematics and Society, United Nations Fund for Population Activities, United States Army Medical Research and Development Command, United States Civil Service Commission (Bureau of Intergovernmental Personnel Prog.), United States Department of Health, Education, and

Welfare: Bureau of Community Health Services, Fogarty International Center (National Institutes of Health), Health Resources Administration, Division of Research Resources, National Aeronautics and Space Administration, National Heart, Lung, and Blood Institute, National Institute of Allergy and

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Radiology

WILLIAM B. SEAMAN

Professor and Chairman • Director of Service

The major thrust of the activity of the Radiology Department this year was directed towards cost containment, reduction of the radiation dose to the patient and the development of new imaging techniques. Preliminary work has begun in the areas of electronic imaging, nuclear magnetic resonance and positron emission scanning.

Significant decrease in the patient radiation dose has been accomplished in some areas by the use of rare earth intensifying screens. The use of cameras which record the image on the output phosphor of an image intensification tube reduce patient dosage by a factor of five to ten as compared to conventional spot film techniques. The latter also reduces film costs, an increasingly important consideration in these times of skyrocketing silver prices. Our quality assurance program has been intensified.

The logistical complexities of running a modern x-ray department efficiently, particularly in regards to film and report retrieval and patient identification, can only be solved by computers. Computerization of the radiology department is an important objective which we hope can be achieved in the near future.

Research Activities

Dr. Austin and Dr. M. Schnur are investigating the clinical significance of thickening of the posterior wall of the bronchus intermedius as seen on the lateral chest roentgenogram. Drs. Kent Ellis, J. Austin, and M.K. Thorsen are reviewing the use of the oblique and lordotic plain chest films in evaluating correlating with the findings on chest tomography. Dr. Aus-

tin, along with Drs. Y. Enson and H.M. Thomas, III (Medicine) are correlating the physiologic and radiologic findings in patients with chronic interstitial lung diseases. Dr. S. Hilal, S. Ganti, J. Silver, along with Drs. J. Michelsen and Peterson (Neurosurgery) are evaluating the findings on computed tomography in patients with subarachnoid hemorrhage secondary to aneurysm. Dr. S. Hilal, S.R. Ganti and J. Silver are reviewing the tumors of the lateral and third ventricle. Drs. W. Casarella, D. Habif and D.W. Seldin are exploring the use of radionuclide scanning as a method of detecting renovascular hypertension amenable to treatment by angioplasty. Dr. Seldin and Dr. A. Nichols (Medicine) are evaluating the clinical applications of multi-gated cardiac blood pool scanning. Drs. R. Fawwaz, P. Esser, and D. Seldin with Dr. Eftekhari (Orthopedic Surgery) are applying radionuclide studies for the evaluation of postoperative complications of total hip arthroplasties.

Dr. Rashid Fawwaz with Drs. Hardy, Nowygrod, Oluwole, and Reemtsma (Surgery) are completing the small animal phase of their studies on the control of cardiac allograft rejection with TD-109-hematoporphyrin. The relationship of structure and function of the metallo-porphyrins is being studied by Dr. Fawwaz and Dr. Hembright of Howard University, Washington, D.C. and Dr. T. Wang and Dr. Tomashevsky (Pathology). The role of dimethylsulfoxide (DMSO) in potentiating the bone-seeking properties of ethylene-hydroxy-diphosphonate (EHDP) was first discovered by Drs. R. Fawwaz, T. Wang and P. Esser. Drs. T. Wang and R. Fawwaz

are investigating the feasibility of labeling a fatty acid which would localize better in myocardium. Dr. R. Gold with Dr. Fawwaz and Dr. Seldin are comparing the relative merits of transhepatic angiography in Tc-99m PIPIDA in patients with biliary disease. Drs. S.K. Hilal, S.R. Ganti and G.F. Ascherl are evaluating the use of high resolution computed tomography of the sella. The evaluation of the third ventricle region by computed tomography is also being studied by Drs. Ganti and Hilal. Computed tomography of supratentorial gliomas is being evaluated by Dr. S.K. Hilal and Dr. S.R. Ganti.

Dr. Ascherl is investigating the problem of craniostenosis with Drs. P. Carmel and M. Luken (Neurosurgery).

Drs. Hilal and Sane, in conjunction with Dr. J. Michelsen (Neurosurgery) and Dr. Janecka (Head and Neck Surgery), are continuing their development of a technique for intravascular embolization in the treatment of head and neck tumors.

Dr. F. Kelcz and Dr. S. Hilal are continuing their study of the measurement of regional blood flow using C.T. and the inhalation of stable xenon.

Dual energy C.T. scanning is being developed by Drs. P. Joseph, F. Kelcz and S. Hilal.

Drs. K. Ellis, John Austin, and Dr. S. Frank are studying inspiratory and expiratory chest x-rays in order to quantitate regional differences in ventilation. Dr. Ellis, together with Drs. James Shapiro, Alan Hordof and Welton Gersony are studying hypertrophic cardiomyopathy in infants and children. Dr. Ellis and Dr. Abraham Shaffer are studying the pathogenesis and significance of coarctation of the aorta.

Dr. Casarella continues his investigation of new therapeutic applications of angiographic techniques in dilating stenotic arteries, dissolving clots by infusion of thrombolytic agents and the non-operative drainage of the biliary tree and abscess cavities.

Dr. C.H. Chang continues his research efforts in radiation sensitizers and protectors. In collaboration with Drs. Edgar Housepian and Ronald Brisman, Dr. Chang has treated 16 patients with malignant gliomas using a new radiosensitizer, Misonidazole. Some initial enhanced tumor response has been observed. With Drs. L. Harisiadis, and Kessarlis, and T. Yang, Dr. Chang is treating patients with metastatic melanoma using controlled local hyperthermia induced by microwaves.

Dr. N.D. Kessarlis developed a technique for doing transverse axial film tomography using a therapy simulator. He has also developed a film dosimetry technique of multiple adjacent electron beam ports.

Drs. Rossi and Zaider have further developed the

Theory of Dual Radiation Action, using data from recent radiobiological experiments with associated charged particles.

Dr. Eric J. Hall performed experiments with a variety of electron affinity radiosensitizers and commonly used chemotherapy agents to study their interaction with ionizing radiations.

Dr. Carmia Borek has successfully demonstrated the induction by x-rays of neoplastic transformations in human cells cultured *in vitro*, and continued a study of the effect of promoters and inhibitors on the incidence of transformation.

Dr. Charles Geard studied the production of sister-chromatid exchanges and chromosome aberrations in mammalian cells treated with x-rays, chemotherapy agents and electron affinic radiosensitizers.

Dr. Richard Miller carried out experiments with an established cell line to score the frequency of oncogenic transformations produced by x-rays and found that dose fractionation led to an enhanced response at low dose levels.

Drs. Michael Freeman and Paul Goldhagen began to study the physical and radiobiological properties of the low energy radiation from Iodine-125 seeds which are currently used for interstitial implants in radiotherapy.

Dr. Paul Kliauga has studied the effect of magnetic fields on the response of Rossi-type proportional counters.

Personnel

The Department of Radiology respectfully records and mourns the loss of Dr. Philip M. Johnson who died suddenly in November. Dr. Johnson had been associated with Presbyterian Hospital for more than 25 years, beginning with his residency in radiology. He almost single-handedly developed a Division of Nuclear Medicine and was nationally known for his writings and textbook.

Staff Activities and Honors

Dr. William B. Seaman was elected Chairman of the Board of Chancellors of the American College of Radiology. Dr. Seaman was also honored by being awarded the Gold Medal of the Association of University Radiologists for his contributions to academic radiology, and the Walter B. Cannon Medal of the Society of Gastrointestinal Radiologists for his contribution to that specialty. He gave the Carman Lecture of the St. Louis Radiological Society and the Leonard Warren Lecture of the University of Maryland.

Dr. Walter E. Berdon has been elected President of the Society for Pediatric Radiology and was named

President-elect of the New York Roentgen Society. Dr. Kent Ellis is Secretary of the Fleischner Society. Dr. Harald Rossi continues his membership on the International Commission for Radiological Units (ICRU), National Council on Radiation Protection and Measurement (NCRPM) and the Committee on the Biological Effects of Ionizing Radiation (BEIR) of the National Academy of Sciences. He is also Chairman of the Technical Advisory Committee on Radiation to the Commissioner of Health, City of New York.

Dr. Frieda Feldman continues her activities as examiner for the American Board of Radiology.

Dr. William Casarella was appointed Vice Chairman of the Department of Radiology. He is also president of the Society for Cardiovascular Radiology and a member of the Executive Committee of the Council on Cardiovascular Radiology of the American Heart Association.

Statistics

The overall workload did not change significantly from the previous year, although important increases occurred in angiography, C.T. scanning, and urology, while the work volume in the other areas remained unchanged, except for a slight drop in the Eye Institute and Harkness Pavilion.

Department of Radiology Statistics

	<u>1979</u>	<u>1978</u>
Babies Hospital	17751	16900
P. H.—Third Floor	43139	40510
Harkness Pavilion	22946	23280
Atchley Pavilion	19636	19850
Vanderbilt Clinic		
Day	21410	22922
Evening	28901	28916
Night	11001	10382
	61302	62220

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	<u>1979</u>	<u>1978</u>
Urology	4396	4981
Neuro	12205	12272
C. T. Scan	4756	3300
Angio	2263	1933
Eye Institute	<u>1948</u>	<u>2328</u>
	191352	189338

ULTRASOUND

Echo-encephalogram	47	100
Echo-cardiogram	2190	2250
Ultrasonogram	3089	2760
Obstetrics	<u>2486</u>	<u>1558</u>
	7815	6658

NUCLEAR MEDICINE

Thyroid Scans	516	593
Liver Scans	2049	2037
Gallium Scans	458	509
Bone Scans	1634	1510
Lung Scans	749	926
Other	<u>1260</u>	<u>1101</u>
	6666	6676

RADIOTHERAPY

	<u>1979</u>	<u>1978</u>	<u>1977</u>
No. Treatments	21253	21004	22396
No. Patients	1225	1207	1311

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Rehabilitation Medicine

JOHN A. DOWNEY

Simon Baruch Professor and Chairman • Director of Service

The past year has brought involvement in new areas. Our attending staff physicians participated in the award winning* educational television series "Disabilities: Causes and Rehabilitation," presented by CBS's Summer Semester. Its goal was to educate the general public so that they better understand and facilitate the mainstreaming of handicapped individuals into our society and to impart to the disabled an awareness that adaptation and rehabilitation are attainable.

In November our department co-sponsored with the Foundation of Thanatology a symposium; "Be-reavement of Physical Disability: Recommitment to Life, Health and Function." The participants included representatives of patients, allied health professionals, medical ethics, Psychiatry and Rehabilitation Medicine. The focus was on problems of mourning and depression in patients with loss of body parts or function.

A Rehabilitation Services Administration grant was received in the form of a five year renewal to facilitate long term residency training programs.

Drs. Lucien Cote and John Downey continue to direct the expansion and renovation of the Rehabilitation Medicine laboratories, as well as supervise additional postdoctoral training.

Teaching

Teaching responsibilities continue to expand.

*President's Committee on Employment of the Handicapped, awarded to CBS and St. John's University conjointly for series production.

Members of the department again participated as preceptors in the Physician-Patient Relationship course for first year medical students. Participants were Drs. Jonathan Moldover, Caroline McCagg, Erwin Gonzalez and Stanley Myers.

The Rehabilitation Medicine Service, in cooperation with the task force on Ethics and Values in Health Care, formulated an education tape for students illustrating value problems arising in the discipline of Rehabilitation Medicine. This will be utilized in the course of Ethics and Values as patient models for teaching conflicts and values in medical care. The task force consists of non-physicians including philosophers, ethicists, anthropologists, attorneys, sociobiologists, historians, etc., as well as participating physicians of our department. The interchange of information and ideas has already proven to be of benefit. This course is being presented to students for the first time this year with Dr. Stanley Myers as faculty member.

The summer student program, under the sponsorship of the J.M. Foundation, was again successfully conducted, providing an experience for selected undergraduate college students, those entering medical school and students completing their first year of medical education. In addition, several students were also assisting research activities in the laboratories. A total of nineteen students were involved.

Because of changes in the first and second year curriculum, the department did not contribute to the Introduction to the Patient course this year. This has been the most successful component of our medical

student teaching activities and it is hoped that departmental participation will continue in the future.

The third year clinical clerkship continues to improve and is well received.

The elective program for medical students is also attracting students on a regular basis, with five students from the College of Physicians and Surgeons participating this year. It is felt that in the future increasing numbers of students will participate and may, if they elect, be sponsored by the J.M. Foundation student program in Rehabilitation Medicine.

Residency Program

The residency training program continues to improve in quality and scope under the directorship of Dr. Erwin Gonzalez. The residents participate with teaching of Gross Anatomy and Surface Anatomy to the medical students. As well as presenting symposia in our department, they attend conferences and teaching sessions at other educational facilities. We have increased the number of invited guest speakers from within the Medical Center as well as from outside.

Research

Drs. Lucien J. Cote and Leon Kremzner (Neurology) have completed a study of the turnover rates of monoamine oxidase (MAO), acetylcholinesterase (AChE), ornithine decarboxylase (OD), and S-adenosylmethionine decarboxylase (SAMDC) in brains of mice as related to age. They observed no significant difference in the rates of turnover of MAO and AChE with age. However, in the case of enzymes with rapid turnover times such as OD and SAMDC, a delay in the induction of these enzymes was observed in old mice. Once initiated, however, they reach the same levels of activities as in young mice.

Dr. Cote and Joyce Ilson (Senior Neurology Resident), and Ms. Karen Russo are establishing a clinical laboratory for assessing the peripheral autonomic nervous system. The goal is to investigate functional changes in the peripheral autonomic nervous system associated with aging and in various neurological diseases, such as parkinsonism, Shy-Drager syndrome and dementia.

Drs. Downey, Cote, Larry Crawshaw and Fredi Kronenberg, in collaboration with the Department of Obstetrics and Gynecology, are continuing their studies of the pathophysiology (changes in temperature, blood flow, cardiac functions, and so on) and the endocrine changes (e.g., polypeptides) observed during hot flashes associated with menopause.

Dr. Cote and associates are studying the alterations

in neurotransmitter synthesizing enzymes as related to age, and in various neurological diseases. Profound changes in enzymes involved in the synthesis of catecholamines occur with age. This observation suggests that physiological events associated with age, such as change in gait, posture, memory impairment, altered sleep pattern, temperature regulation, and so on, may be related to neurotransmitter system changes seen in the aged.

The pain study research project, directed by Dr. Stanley Myers, continues with emphasis on the investigation of the effect of electrical pain and ischemia on somatosensory cortical and peripheral evoked responses.

The joint project with the Department of Psychiatry on the cardiovascular and autonomic effects of tricyclic antidepressant medication is proceeding. The study comparing the effects of imipramine and desipramine on blood flow, heart rate and blood pressure following tilting, cold, and mental stimuli has been concluded and the results are being compiled. Mr. Dick Bruno (graduate student) and Dr. A. Glassman (Psychiatry) are involved in this project together with Dr. Myers.

Dr. Erwin Gonzalez has concluded a study in femoral fracture in lower extremity amputees and the results were presented at the American Congress of Rehabilitation Medicine. Also concluded was Dr. Gonzalez's study on the use of eccentric vs. concentric contraction in strength development.

Ann Edgar, R.P.T. continues her study of patients with Juvenile Rheumatoid Arthritis. She has evaluated range of motion of knees and hips of 160 patients, whose parents are being instructed in a comprehensive exercise program, in an attempt to see if specific physical therapy intervenes in the prevention or decrease of the occurrence of limited external rotation of the hips.

Dr. Jonathan Moldover continues research investigating the cardiac responses to exercise with emphasis on evaluation of patients with combined cardiac and other physical disabilities. He also began collaborative studies with the Department of Medicine investigating the effects of physical conditioning programs on patients with cardiac or pulmonary disease.

Patient Care

The inpatient Rehabilitation Medicine Service at the Medical Center has been expanded to include four private beds on the seventh floor of the Neurological Institute. The Service continues to maintain a high level of occupancy. Dr. Jonathan Moldover assumes directorship of the service in 1980.

Clinical physical therapy has begun treatments to patients in their homes. The number of referrals for this program continues to increase from the Harlem/Washington Heights/Inwood areas. A similar program is being planned by Occupational Therapy for early 1980. Hospital based physical therapy has been expanded to include outpatient therapy for those suffering from chronic lung disease. The private patient physical therapy service has expanded to include evening and Saturday coverage. An orthotics clinic under the direction of physiatrist, therapist, and orthotists, has been developed to facilitate and coordinate the provision of orthoses. Members of the entire service have joined to conduct a stroke club comprised of stroke patients and their families and friends, its purpose being to mainstream such patients back into their family and community lives.

The cardiopulmonary rehabilitation program has enlarged its role to provide more complete rehabilitation services to patients with chronic pulmonary and cardiac diseases. The unit continues to provide chest physiotherapy for those patients with acute pulmonary problems. An outpatient program has been added which provides comprehensive patient education, breathing exercises, relaxation and endurance training for patients with chronic obstructive pulmonary disease. In the area of cardiac disease two programs are currently available. The first involves patients who have recently suffered an acute myocardial infarction. Upon leaving Intensive Care they are placed on a graduated exercise program. At discharge they continue with a home program of gradually increasing endurance training. An outpatient program is available for patients with healed myocardial infarction or other forms of cardiac disease which result in decreased exercise tolerance. For those patients, an exercise tolerance test is performed and a more intensive conditioning program is undertaken. The unit provides cardiac stress testing for those unable to undergo traditional evaluative methods, such as physically handicapped individuals who have coexisting cardiopulmonary disease. During the coming year the unit hopes to further enlarge its role by including occupational therapy for patients with permanently reduced exercise tolerance to reduce energy expenditure during daily activities.

The Rehabilitation Medicine Clinics have been restructured to include one attending physician assigned specifically for teaching. In addition there have been established a brace clinic and a wheelchair clinic. An active effort to increase patient visits is being made by routine telephone and/or written notification to patients who have missed their appointments.

Programs in Occupational and Physical Therapy

Physical Therapy

Major accomplishments for the year were the approval of an entry level Master of Science degree program in Physical Therapy, the continued progress in harmonizing relationships and activities in interdisciplinary, departmental and interdepartmental areas, and participation in a Health Sciences Alumni Fellowship group at the College of Physicians and Surgeons. Fund raising, educational workshops, continued funding for the second year of a grant, and the attainment of a jointly developed project (Occupational Therapy and Physical Therapy) were accomplished. The annual appeal to the Physical Therapy Alumni, and an annual donation of \$2,000 by George Miller, a graduate, (to the G.E. Miller, Inc. Gift account) provided scholarship assistance. A two-day workshop entitled Uses of Dance in Rehabilitation developed by Professor Bernadette Hecox raised funds for the G.P. Philips Educational Fund. The final year of a two-year grant (Special Project for Clinical Faculty Development) culminated in two two-day workshops dealing with the Problem-Solving Process. The second year of an approved three year grant on Management of Clinical Education was funded. A new project developed by Occupational Therapy and Physical Therapy was funded for one year. One workshop related to clarification and resolution of issues in supervision was conducted late this year. The second workshop will occur in 1980. The Center for Geriatrics and Gerontology has been awarded a development grant for a Long Term Gerontology Center, authorized under the Older Americans Act. Professor Dickinson is a member of the steering committee.

Occupational Therapy

As a result of a two year Allied Health Special Improvement grant for curriculum development directed and coordinated by Associates Nedra Gillette and Margaret Brown, respectively, the M.S. program was changed beginning with the 1979 entry class, to include four rather than three academic semesters and six rather than eight months of required field work. Students will have the option of taking an additional two/three month specialty field experience if desired. The fourth semester has enabled us to strengthen the treatment related courses in pediatrics and geriatrics, the research and/or teaching methodologies, and the elective components of the curriculum. Under the direction of Assistant Professor Barbara Neuhaus, a three year continuation Allied Health Project Grant presently in its second year is directed toward planning and initiating Advanced

Graduate Programs in Occupational Therapy. The first 1½ years consisted of establishing the need for the proposed program, and its planning. The program has been approved to date by the appropriate committees of the Faculty of Medicine. The plan enables students to elect one of two tracks in a 36 credit M.S. degree in Administration or Education. If approved, it is proposed to admit students in September 1980. Effort is now being directed to locating sources of scholarship aid which will enable therapists to take a year without earned income; otherwise, it will be geared to part-time and evening students. An Allied Health Training Institute grant to Physical and Occupational Therapy was funded. The purpose of this grant is to conduct an Advanced Training Institute in supervision for graduate therapist. One hundred ten therapists registered. For the past several years, we have solicited grant funding to help reinforce and strengthen the clinical arm of the faculty and to compensate faculty for teaching. Associate in Occupational Therapy Diane Shapiro, is the director.

Blythedale Children's Hospital

Dr. Yasoma Challenor served as Program Chairman of the New York Society of Physical Medicine & Rehabilitation, as co-editor of the New York Society of Physical Medicine & Rehabilitation *Newsletter*, continued on the Board of Directors of the American Association for Electromyography and Electrodiagnosis and served on the Program Committee for the 1980 meeting of the American Association of Children's Prosthetics and Orthotics Clinics.

Helen Hayes Hospital

The faculty continues to participate in the residency training program and medical student orientation to Rehabilitation Medicine. Dr. Sally Wisely was named head of the Spinal Cord Injury and Medical Miscellaneous Units. Dr. Bhattacharyya was appointed to membership on the Utilization Review Committee.

Harlem Hospital Center

Dr. Albert D. Anderson, A.D. Gurewitsch Professor of Clinical Rehabilitation Medicine relinquished his position due to ill health. The overall clinical and administrative responsibilities were assigned to Dr. Herbert L. Thornhill in the interim. During the past year patient care activities continued at a level consistent with Departmental goals and objectives. The maintenance of high occupancy of the inpatient service was achieved, despite decreased hospital census. Ms. S. Zarapkar was appointed Chief Occupational Therapist.

Overlook Hospital

This was the first year that the Department of Rehabilitation Medicine had a resident rotate through Overlook Hospital. Dr. Francis J. Foca actively participates in the residency training program and attends the Prosthetic Clinic at Columbia Presbyterian. He was elected Treasurer of the New Jersey Society of Physical Medicine and Rehabilitation and participated in an Audit Review of Amputee Management at Overlook, which resulted in the introduction of an Amputee Management Program.

St Luke's Hospital Center

A pain clinic is being established with the cooperation of the Anesthesia and Psychiatry Services. Drs. Alfred Peng, Ravi Malpe and Keither Sedlacek will be participating. In October, St. Luke's Hospital Center and Roosevelt Hospital merged, forming St. Luke's Roosevelt Hospital Center. Merger of the two Rehabilitation Services is in progress. A committee to study the needs of the service is headed by Dr. William Clark. Areas of research have produced written results of an acupuncture research projects, the study of dance therapy for the physically disabled conducted by Ms. Bernadette Hecox; biofeedback for the relief of hypertension by Dr. Keith Sedlacek and biofeedback for muscle rehabilitation by Dr. Ravi Malpe.

Honors and Achievements

Dr. John A. Downey was named Chairman of the Faculty Advisors of P&S; participated in the Arthritis Foundation telethon and public forum in February; was Visiting Professor at the University of Toronto and the University of Saskatchewan as well as serving as consultant to the Department of Rehabilitation Medicine of the Medical University of South Carolina.

Erwin G. Gonzalez was re-elected chairman of Ad Hoc Council of Physical Medicine and Rehabilitation Societies of the American Academy of Physical Medicine and Rehabilitation; serves as chairman of Executive Committee of the New York Society of Physical Medicine and Rehabilitation, and was appointed by the Health Commissioner of the City of New York to the Advisory Council for Prosthetics & Orthotics.

Dr. Stanley J. Myers was senior medical advisory board member of the National Wheelchair Athletic Association at the Tri-state Wheelchair Games. Patricia Storjahann, R.P.T. and Denise VanderVliet, R.P.T. were invited to participate as oral examiners for the American Physical Therapy Association by the licensing division of the State Education Department.

Patricia Miller, O.T., received the Brookdale Fellowship award to pursue a project entitled, "A Training Manual to Combat Ageism and Promote Rehabilitation."

Barbara Neuhaus, O.T., was the recipient of the Award of Merit for contributions to the occupational therapy profession by the New York State Occupational Therapy Association; was the recipient of the Obrock Award Research Grant from the American Occupational Therapy Foundation for a project on rationales for and against hand splinting in hemiplegia; was a representative of the World Federation of Occupational Therapists to WHO, Region of the Americas.

Dr. Jonathan R. Moldover presented the following papers: "Cardiac Fitness—Facts and Myths" at the Medical Society of The State of New York Annual Convention; "Comparison of the Cardiac Response to Exercise on Three Different Ergometers" at the American Academy of Physical Medicine and Rehabilitation, 41st Annual Assembly.

Joan Smith, R.P.T. and Patricia Storjohann, R.P.T. participated as oral examiners for the American Physical Therapy Association. Paul Ribera, R.P.T. wrote an informative booklet for amputee patients entitled "Guidelines for the Below-knee Amputee." Adele Germain, O.T., gave a Guest Presentation on "Neuromuscular Development" at the 2nd Annual Board of Education Professional Conference for the Education of the Severely and Profoundly Retarded at Marymount Manhattan College.

Diane Shapiro, O.T., was a guest faculty member accompanying an American Occupational Therapy

Association sponsored tour of Soviet Union. She presented a paper entitled "Loss, Motivation and Activity." Laurelee Hawkins, O.T.R. was a panel member on WOR Radio program dealing with stroke victims and disability and a judge at Rehabilitation Films International Film Festival in New York City. Laura Hoffman, O.T.R. was a speaker at the Orthopedic Nursing Association, discussing the role of O.T. for patients with Total Hip Replacements and was main speaker at a Splint Workshop sponsored by Metropolitan New York District of the State Occupational Therapy Association.

Acknowledgements

The continued support of our various endeavors by the Anonymous donor has allowed Rehabilitation Medicine to continue its ongoing programs as well as plan for future endeavors.

The support of Mrs. H. Lawrence Bogert and the J. M. Foundation allowed for continuance and expansion of the teaching programs to undergraduate, graduate and medical students in the discipline of Rehabilitation Medicine, its principles and practices.

Mrs. Dorothy Scott's continued support and encouragement of our recreational program, now servicing all of Neurological Institute, is deeply appreciated.

Mr. and Mrs. Simon Rose continue to aid our work in several areas of research, along with the support of the Heineman Foundation.

Hoffman-LaRoche Incorporated has generously contributed to the physical therapy services of our Department.

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Surgery

KEITH REEMTSMA

Valentine Mott Professor and Johnson and Johnson Professor and Chairman • Director, Surgical Services

The Surgical Service looks forward to the final phases of planning preparatory to beginning the long-awaited renovations of the facilities over the next eighteen months. Members of the staff have been involved in all aspects of the planning, even down to architectural details, as the plans for each clinical area are negotiated and approved.

Undergraduate Teaching

The Education Committee, under the chairmanship of Dr. Philip D. Wiedel, has been responsible for the direction of several courses given by the Department and the development of new ones. Dr. Wiedel has also been appointed Chairman of the Medical School's Clinical Committee.

First Year

Dr. Alfred Jaretzki III has continued to coordinate the Department's participation in the teaching of Gross Anatomy. Members of the Department in the affiliated hospitals have again taken an active role in this course. Dr. Jaretzki has also continued to organize the Correlation Clinics. Several members of the Department have again served as preceptors in the course on Doctor-Patient relationships.

A series of seminars entitled "Clinical Research in Surgery" has been organized under the direction of Dr. Spotnitz as an elective course for First and Second Year students. Students in these years have also been offered the opportunity to participate in research projects on a regular part time basis, with the prospect of a more intensive commitment during vacation periods in the future.

Second Year

The Department participated with the Department of Medicine in the teaching of Abnormal Human Biology. Dr. Paul Lo Gerfo organized the participation by the Department in the newly reorganized course Introduction to the Patient.

Third Year

Dr. Robert Bertsch has continued to direct the Surgical Clerkship. The change in the organization of the General Surgical Service from three Services, each with a different special orientation, to two Services with an equal mixture of special interests, has made it possible to provide wider exposure to surgical disease than before. On the other hand, the scattering of surgical patients throughout the Medical Center, which has followed the Open Admissions policy, has made the necessary close supervision of student activities more difficult.

Fourth Year

The elective program has continued under the direction of Dr. Spotnitz.

Graduate Education

Major efforts are made to maintain flexibility in our program in order to tailor it to the various career plans of our residents. Most of those choosing to finish a general surgery program continue in our program for three further years of training culminating in a year as senior resident where extensive opportunities for independent operating and leadership exist. Those desiring further graduate training in this

department may compete for graduate residencies or fellowships in thoracic and cardiovascular surgery, pediatric surgery, plastic surgery and vascular surgery. A special Academic Surgery Fellowship is available for unusually qualified and productive residents.

Postgraduate Education

Dr. Jose M. Ferrer, Professor of Surgery and Associate Dean for Postgraduate Education, coordinates the postgraduate activities for the Department, which include sixteen regularly scheduled conferences approved for credit in Category I of the A.M.A.'s Physician's Recognition Award.

As part of the Continuing Medical Education Program for Community Hospitals, seven members of the Department presented nine lectures on surgical topics at three community hospitals. In addition, Dr. Keith Reemtsma and Dr. David Bregman participated in the Dean's Day Symposium on Atherosclerosis.

Research

Surgical Metabolism Program

The Surgical Metabolism Program, under the direction of Dr. John M. Kinney, has continued active investigation in areas related to gas exchange, ventilation, energy metabolism and tissue fuels. This program integrates the Surgical Metabolism Unit in Presbyterian Hospital directed by Dr. Frank E. Gump and Dr. Jeffrey Askanazi, with the metabolic laboratories directed by Dr. David H. Elwyn and the data processing activities directed by Robert Foster. A dedicated team of nurses, directed by Irene McLeod, along with the research dietitians Mary Iles and Yvonne Schwartz, provide a controlled clinical environment for both patient care and clinical investigation.

1. *Calorie/Nitrogen Interrelations*—Dr. David Elwyn is continuing a long term investigation which has already indicated that the nitrogen balance of surgical patients is more related to the energy balance than the energy intake. Previous studies with only modest levels of nitrogen intake are being supplemented by parallel studies at high levels of intake. Dr. Hamish Munro, Director of the Institute of Human Nutrition at Tufts University, has served as consultant and collaborator on these studies.

2. *Glucose Kinetics in Injury and Infection*—Previous studies directed by Dr. Elwyn have shown that the carbohydrate abnormalities of injury and sepsis are not abolished simply by giving large amounts of carbohydrate as part of total parenteral nutrition. Dr. Askanazi has completed studies which

document that the carbohydrate loads above calorie equilibrium which are widely administered as part of total parenteral nutrition, cause an increase in CO_2 production as predicted. In addition, such loads during the acute catabolic phase also cause a sharp increase in O_2 consumption and in catecholamine excretion. Therefore, the acutely ill patient will not achieve a CO_2/O_2 ratio above 1.0 which characterizes the depleted patient who readily demonstrates net lipogenesis with the same carbohydrate load. Further studies are being designed to investigate the mechanism of this unexpected observation.

3. *Rate of Protein Synthesis*—Drs. Chikenji and Elwyn are developing a method for measuring the rates of protein synthesis in tissues of the rat and dog. The procedure requires determination of the specific activities of lysine in lysyl-t-RNA in plasma, intracellular fluid and tissue protein. This will be used to measure the effects of trauma and sepsis on protein synthesis in liver, muscle and skin.

4. *Lipid Metabolism in Injury and Infection*—Previous studies in this program have shown that injury and sepsis distort the usual relationship between the level of circulating glycerol and its turnover rate. Dr. Nordenstrom and Dr. Robin have been conducting studies which indicate parallel findings in the metabolism of labelled palmitate in acute surgical patients. Studies with ^{14}C -Intralipid have shown that increased rate of clearance from the blood are associated with increased oxidation in acute surgical patients but that high carbohydrate intake depresses the oxidation rate in the face of increased removal from the blood. Studies of acute surgical patients receiving total parenteral nutrition with the non-protein calories supplied with equal parts of carbohydrate and lipid have been compared with patients for whom the entire non-protein calorie source was carbohydrate. The patients receiving carbohydrate and lipid demonstrated a reduced plasma removal of a lipid emulsion while both hypermetabolic and depleted patients had higher than normal removal rates compared with normal subjects. The oxidation of this exogenous lipid was essentially normal in the patients receiving both carbohydrate and lipid, while being markedly reduced in both hypermetabolic and depleted patients receiving only carbohydrate for non-protein calories.

5. *Muscle and Plasma Amino Acids*—With the collaboration of Drs. Frank Stinchfield and Christopher Michelsen (Orthopedic Surgery) Dr. Askanazi and co-workers have undertaken studies of patients undergoing total hip replacement as a model of soft tissue and skeletal injury. Data on the free amino acids of muscle and plasma of such patients receiving peripheral infusions of glucose, amino acids or both revealed prompt and constant alterations in muscle

and less constant changes in plasma on the fourth postoperative day. It appears that the total free intracellular pool of amino acids in muscle is decreased because of reduction of muscle glutamine to approximately half while many of the essential amino acids are increased. Studies after major accidental injury with or without subsequent septic complications are currently nearing completion. It appears that major accidental injury produces similar changes in the muscle pattern of free amino acids as is seen in the postoperative patients, while sepsis causes similar but more marked changes. Studies are being designed to examine the mechanisms and significance of these changes, and how they compare with various non-surgical catabolic states.

Dr. Kouno Yi Liaw undertook studies of the high energy phosphate compounds of muscle biopsies in postoperative, moderate and severely injured patients. He discovered that in the latter group, there was a significant decrease in both the ATP and phosphocreatine content, despite no evidence of shock or local ischemia which might be expected to damage mitochondrial production of high energy compounds. These and related studies are being continued by Dr. Lisa Kantrowitz.

6. Non-Invasive Spirometry and Gas Exchange—A unique canopy-spirometer-computer system continues to be used to obtain detailed measurements of gas flow and timing of the subdivisions of each breath, in normal subjects and surgical patients who are acutely hypermetabolic or have become hypermetabolic with extensive tissue depletion. These studies are being conducted with the stimuli of increased inspired CO_2 and controlled amounts of supine exercise, looking for changes in the breathing patterns of the hyperventilating surgical patient as the cumulative tissue loss develops as judged by the negative balance of nitrogen and calories. Dr. Stanley Rosenbaum and Dr. Allen Hyman of the Department of Anesthesiology are working with Dr. Askanazi to examine the influence of curare on the pattern of breathing of normal subjects. Dr. Otto Szekely has developed a supine exercise test which has been well standardized in normal subjects and can be used for ventilatory and metabolic studies in surgical patients. Dr. Askanazi has completed studies of ventilation and gas exchange of surgical patients before and during administration of high-carbohydrate, fat free, total parenteral nutrition. These studies have emphasized that a high carbohydrate load is a CO_2 load and that certain patients who receive this type of nutrition in the presence of compromised pulmonary function, will have their respiratory work increased and a few may actually be thrown into pulmonary failure. In addition, such nutrition is to be avoided

during the period of weaning patients off of mechanical ventilation.

7. Postoperative Fatigue—Continuing their investigations into the nature of the fatigue which follows operative procedures or periods of bed rest, Drs. Thomas C. King, Eric Rose and Hannibal Edwards have developed some easily performed tests to evaluate psychomotor function, muscle strength and endurance, and cardiorespiratory response.

A surprising deterioration in psychomotor function and muscle endurance develops three to four days after even minor surgical procedures or enforced bed rest. Derangement of cardiorespiratory response to minimal exercise also occurs in the early postoperative period but was noted to persist for weeks in the subjects analyzed. Current investigation is directed at determining the various causes of these observed disabilities from among the many potential influences: anesthesia and other drugs, bed rest, sleep deprivation, etc. Successful techniques to attenuate these changes could have substantial socioeconomic consequences.

Hepatic Regeneration

During the previous year, the laboratory of hepatic regeneration, under the direction of Dr. John B. Price, Jr., reported the results of cross-circulation experiments between normal and hepatectomized rats with or without the gastrointestinal tract present. The results indicated that factors of non-portal origin are responsible for the initiation of hepatic regeneration. During the current year, techniques are being developed and tested to induce the initiation of hepatic regeneration in normal rats by transfer of whole blood, plasma or plasma and white cell fractions from partially hepatectomized rats with or without the gastrointestinal tract present. When active hepatic regeneration has been induced, preservation and fractionation of the potent blood fractions is planned.

Cancer and Cell Physiology

Dr. Carl Feind and Dr. Paul Lo Gerfo are investigating the value of tumor markers in the detection of thyroid cancer. During the past year they have demonstrated that serum thyroglobulin is extremely sensitive in detecting recurrent cancer in the athyroid individual. This assay is at least as sensitive as radioactive scanning for the detection of recurrent disease and works in individuals regardless whether their tumor is able to concentrate iodine or not. In patients with metastatic thyroid cancer, Drs. Feind and Lo Gerfo have shown that serum thyroglobulin levels will fall in some individuals when they are placed on exogenous thyroid suppression. They be-

lieve that this form of thyroid cancer suppression test will enable them to predict those patients whose cancers will respond well to exogenous thyroid administration alone. Five patients with metastatic thyroid cancer have begun treatment with a human form of altered thyroglobulin in the hopes that they will develop autoimmunity to their thyroglobulin-producing cancer. Two of these five patients have developed antibodies to their tumors.

In addition, purified antibodies to thyroglobulin are being evaluated as carriers for cytotoxic drugs and radionucleotides in the treatment of patients with metastatic thyroglobulin producing cancer. Ongoing studies in animals suggest that this methodology may also be effective in localizing parathyroids by new scanning.

Transplantation

The Transplantation Program, under the direction of Dr. Mark A. Hardy, has completed its fourth year of clinical, teaching and research activities. The major clinical emphasis has continued to be on renal transplantation with an increased number of renal transplants to 30 per year. The excellent results, about 15% better than the national average, have attracted an increased number of recipients to the Presbyterian Medical Center Transplantation Unit. Affiliation agreements with satellite dialysis units in the Metropolitan New York-New Jersey area have been firmly established. A shortage of donor organs has continued to be a major problem in satisfying the need of increased number of patients referred for cadaveric kidneys. The excellent results in renal transplantation have been due mainly to the close collaborative effort between the Departments of Surgery and of Medicine in patient management and to the development of improved treatment of rejection by the use of antithymocyte globulin. The clinical study of this modality of treatment is continuing, and in addition to the development of precise methods of detection of early rejection by the use of scanning techniques and C-reactive protein measurements, has constituted the major clinical research projects on the transplantation service.

The heart transplantation effort has now been organized and is being applied to carefully selected recipients. Modification of criteria of acceptance and immunosuppression have been developed. This program is a collaborative effort between the Transplantation Service and the Divisions of Cardio-Thoracic Surgery (Dr. Keith Reemtsma) and Cardiology (Dr. Ronald Drusin and associates).

The Transplantation Program has continued major collaborative clinical research efforts with the Division of Nuclear Medicine in the precise definition of

early rejection; with the Division of Renal Pathology (Dr. Conrad Pirani and Dr. Fred Silva) in the histopathological definition of rejections; with the Division of Immunogenetics (Dr. Nicole Suciu-Foca) in immunological definitions of donors and recipients, and particularly the usefulness of DR matching.

The teaching activities of the program have expanded to include rotating surgical fellows from Harlem Hospital, residents from the internal medicine service and continued education of the surgical house staff. Medical students from all levels, but particularly senior medical students, have had the opportunity to become acquainted with the clinical and research activities of the Transplantation Program.

In the coming year, the Transplantation Program expects between 35 and 40 renal transplants and about 12 heart transplants. The surgical attending staff will be expanded by the addition of one transplant surgeon. Whole organ pancreatic transplantation into juvenile diabetic patients will be initiated in the coming year. The effort to begin a clinical liver transplantation program and to organize a liver failure support system in collaboration with the Department of Medicine will be activated. Clinical research activities in the use of antithymocyte globulin treatment of rejection, as well as an organ donor pretreatment program, will continue.

Endocrine Transplantation

A major research interest of the Transplantation Program both at the laboratory and clinical levels, has been in the area of endocrine organ transplantation. Success has been achieved in the investigations of experimental diabetes and its correction with pancreatic islet transplantation. Investigations of methods of preservation and immunological modification of both pancreatic islet cells and parathyroid is continuing. In the past year, research on pancreatic islet transplantation has shown that islet allografts in animal models can be successfully transplanted without continuous immunosuppression of the recipient. Preservation by culture method is practical and may be applicable to a future clinical effort. The difficulty in obtaining high yields of islet tissue continues to be a strong deterrent to the immediate clinical applicability of this method of treatment of juvenile diabetes mellitus. Separate experimental efforts in whole organ transplantation of the pancreas for correction of diabetes have shown it to be clinically practical. The major effort in increasing the efficiency of islet isolation is continuing, particularly in the larger species, i.e. calf and pig. The research in pancreatic islet transplantation is an interdepartmental effort with close collaboration among the departments of Surgery, Medicine, Pathology and Neurology.

After successful initial trials of transplantation of parathyroid tissue into hypoparathyroid patients in collaboration with Dr. C. Feind, more precise laboratory studies on parathyroid organ culture viability and immunological modifications are continuing. Successful xenotransplantation of human parathyroid tissue to hypoparathyroid rats has been achieved. Work on this subject is continuing in order to develop consistency of results and prolongation of allograft and xenograft survival. This will have major implications, not only for parathyroid transplantation but for all endocrine tissue transplantation. In collaboration with the Division of Immunogenetics (Dr. N. Suciú-Foca), we plan to allograft human parathyroid tissue into selected hypoparathyroid patients with careful studies of the relation between histocompatibility matching and the development of antibodies to the parathyroid tissue. In relation to this, studies will begin in the coming year, on the relation of the development of auto-antibodies to the parathyroid tissue in idiopathic hypoparathyroidism.

Whole pancreatic transplantation in juvenile diabetics who already have a long living renal allograft, will be initiated, and the results will be carefully analyzed from the metabolic and the immunologic aspects.

Laboratory of Immunogenetics

The Laboratory of Immunogenetics is under the direction of Dr. Nicole Suciú-Foca. Research activities this year have been mostly concerned with the laboratory's participation in the 8th International Histocompatibility Workshop. At that workshop, the laboratory was selected as "International Cross Reference Laboratory". This is the first time a U.S. laboratory has achieved this honor. HLA-Disease Association studies for Inherited Ataxia and Juvenile Rheumatoid Arthritis have been investigated along with the continuing exploration of the genetic fine structure of the HLA region. HLA-DR typing and B-cell crossmatches are now routinely used parameters for the Transplant Service.

Division of Artificial Organs

Dr. William H. Dobelle continues to direct the Division of Artificial Organs. In the course of efforts to develop an artificial vision system for the blind (TV camera interfaced through a computer with the visual cortex) Dr. Dobelle's group has implanted electrode arrays on the visual cortex of two new blind volunteers who live in the New York metropolitan area. Surgery was performed by Drs. Donald Quest and John Antunes (Neurological Institute) assisted by Dr. John Girvin of the University of Western Ontario

(who has been collaborating in these experiments with Dr. Dobelle since 1970) and by Dr. J. Donald Finck (Anesthesiology). Dr. Lawrence Pape (Eye Institute) and Dr. Beth Seelig (Psychiatry) played major roles in screening the volunteers.

Experiments with these patients have confirmed and extended observations about the feasibility of developing visual useful, portable prostheses for the blind.

Artificial Pancreas

Development of a hybrid artificial pancreas was begun under the direction of Dr. Gregory Klomp and Dr. Hiroshi Hashiguchi.

Development of a hybrid artificial pancreas involves two separate tasks. The first is to isolate the Islets of Langerhans from the acinar cells. The most promising approach has been to infuse the pancreatic duct with a variety of agents to selectively destroy the acinar tissue. Subsequent use of collagenase to dissociate the pancreas is being conducted in collaboration with Dr. Ines Mandl (Obstetrics and Gynecology). Dr. Philip Ursel (Pathology) is collaborating in histological assessment of this material.

The second part of hybrid artificial pancreas project involves development of appropriate membranes to provide a mechanical immunological barrier. Hydrogels—similar to the materials used in soft contact lenses—seem promising because of their porosity and unusual biological acceptability.

Cardiac Assistance

Efforts in the field of mechanically assisted circulation are directed toward eventual development of the same complementary relationship between cardiac transplantation and mechanical circulatory support as now exists in dialysis and renal transplantation. This work is being conducted in collaboration with Dr. Keith Reemtsma, Dr. Henry Spotnitz, and Dr. David Bregman with collaboration from the Departments of Anesthesiology and Pathology and the Division of Cardiology.

At present, considerable technology for mechanical circulatory support has been developed in laboratories throughout the world, and for the time being, we intend to concentrate on refinement and clinical implementation of such devices rather than to develop completely new systems.

Our first effort has been to implement the simple, roller-pump based Trans Apical Left Ventricular Bypass system. These trials are restricted to two groups of patients for whom there is no other choice—those who cannot be weaned from cardiopulmonary bypass after cardiac surgery, and

end-stage patients awaiting cardiac transplantation who will not survive long enough for us to find suitable donors.

Organ Bank

Shortage of donor organs, particularly kidneys, has been a major barrier to clinical transplantation activities throughout the world. To facilitate participation in organ recovery efforts by many community hospitals, and thus increase the number of donor organs, we have begun a pilot program to routinely transfer donors to the Columbia-Presbyterian Medical Center after the diagnosis of brain death has been made in the community hospital. This seems preferable to the usual custom of dispatching surgical teams and staff to the community hospitals to remove the organs.

Kidneys are shared with other institutions in the New York area through the New York Regional Transplant Program. And Dr. Dobelle and Dr. Mark Hardy, Director of the Division of Transplantation, serve as the representatives to the NY-RTP from the Columbia-Presbyterian Medical Center.

Families who are willing to donate one organ are generally willing to donate all organs. With their permission we simultaneously recover bone for transplantation by Dr. Harold Dick (Orthopedic Surgery), corneas for transplantation in the Eye Institute, skin in conjunction with the Burn Unit at Cornell/NY Hospital, and hearts for transplantation which are shared with colleagues at the Medical College of Virginia.

Students

One major limitation on progress in the field of artificial organs is the shortage of investigators able to conceive and direct programs which require background in medicine, engineering, basic science and administration.

In view of the long time required to train such investigators, we have instituted a program involving gifted high school students nominated by high schools in New York primarily (Bronx High School of Science, Stuyvesant and Hunter College High School).

The enthusiasm and innovativeness of these students has been infectious. Two studies—one a review of FDA regulations regarding Medical Devices and another an analysis of the statistical basis for Organ Bank activities in the New York metropolitan area—have been completed by these students.

Other contributions which have already been made by students include work on the hybrid artificial pancreas and Trans Apical Left Ventricular Bypass, and

most recently, a novel design for electrodes systems for use in future visual prostheses.

Colonoscopy

Flexible fiberoptic colonoscopy is being performed on ambulatory and hospitalized patients under the direction of Dr. Kenneth A. Forde, who participates in the training of gastroenterology fellows of the Department of Medicine, as well as surgical residents who have elected to spend several months of their senior year gaining endoscopic experience.

With Dr. Thomas Colacchio, Dr. Forde has initiated a study of the feasibility of training junior surgical housestaff in the use of the flexible fiberoptic sigmoidoscope in our outpatient clinic.

Areas of ongoing study include: evaluation of colonoscopy as an adjunct to the barium enema in the management of patients with colonic stricture, in diverticular disease and in the diagnosis of rectal bleeding.

Having received limited support for the development of color television systems utilizing endoscopic instruments, almost all procedures are now being performed with the ability of observers and assistants to follow the procedure on a television monitor. This has markedly expanded the educational use of endoscopy.

Surgical Oncology

Clinical oncology is a combined diagnostic and treatment effort. This is reflected in the joint efforts by members of the surgical medical oncology and radiology departments. In breast cancer the limitations of surgery have been recognized for stage II, III and IV breast cancer. The entry of these patients into protocols will provide treatment and valuable information about efficacy. Most patients with advanced breast cancer are so treated now.

Limited results of chemotherapy and surgery alone or in combination for solid tumors have prompted a study using a modified autologous antigen preparation made from host tumor to stimulate an immune response. Dr. Duncan McCollister is coordinating the laboratory aspects, assisted by Drs. Avram Cooperman and Thomas King. Patients with cancer of the esophagus and cancer of the pancreas will be the first to be studied and treated.

Percutaneous decompression of obstructed bile ducts and biopsy of common bile duct tumors through a catheter placed through the liver and main bile ducts is an innovative therapeutic and diagnostic method. Drs. William Casarella, Erick Martin, Richard Sweeting and Avram Cooperman are pursuing this

and have used the technique to biopsy 5 tumors and additional patients.

Cardiac Surgery Research

Improved methods for analysis and preservation of cardiac function continue as a central focus. Analysis of preservation of left ventricular performance in 25 patients undergoing 120-180 minutes of continuous ischemic arrest has been completed and confirms the efficacy of cold potassium cardioplegia. Progress on improved systems for delivery of cardioplegia solutions has proceeded satisfactorily. New data on intraoperative counterpulsation and effects of pulsatile cardiopulmonary bypass is being developed by Dr. David Bregman. Development of a percutaneous technique for insertion of an intraaortic balloon for counterpulsation in low output states has been completed and clinical data is being pursued by Dr. Bregman. Dr. Reemtsma has continued research in clinical cardiac transplantation. A related program of long term left ventricular to aortic bypass in patients refractory to other methods of support is being pursued by Drs. Dobelle, Bregman and Henry Spotnitz.

Function of the Hancock porcine valve prosthesis continues to be reviewed, with no time related pattern of mechanical failure apparent thus far. Drs. James R. Malm and Frederick O. Bowman continue to study complex reconstructive procedures for congenital heart disease. Effects of new techniques for management of intraoperative anticoagulation are under study for effects on perioperative blood loss and transfusion requirements.

Basic research in the operating room includes studies of electrophysiology and electrical mapping of the sinus node, conduction system, and arrhythmias in cooperation with the Department of Pharmacology. Dr. Spotnitz has continued studies of decreased left ventricular compliance as a possible sign of injury after ischemia. Hearts protected by cold potassium cardioplegia appear less susceptible to decreases in compliance. Studies of the effects of surgical disease states on left ventricular compliance have recently been completed. Drs. Spotnitz and Calvin Wong have demonstrated decreased left ventricular ejection fraction by intraoperative echocardiography after valve replacement for mitral regurgitation, confirming unfavorable effects of acutely increased afterload on left ventricular function. The degree of alteration in afterload has been confirmed by intraoperative studies of left ventricular mechanics. Initial studies of left ventricular performance during open heart surgery based on two-dimensional echocardiography have been completed and confirm the unusually marked decrease in ejection fraction following correction of mitral regurgitation, as well

as demonstrating the great potential value of this new method.

In the Cardiovascular Surgery Research Laboratories, Dr. Spotnitz and Dr. Robert Collins are investigating accuracy of two-dimensional echocardiography for measurement of left ventricular volume, mass and ejection fraction during thoracotomy. Dr. Bregman continues development of improved methods for assistance of the failing heart by copulsation, a new technique of promise in heart failure refractory to counterpulsation. Initial studies of effects of cardiac contracture on regional ventricular wall properties have been completed by Dr. Charles Marrin and Dr. Spotnitz.

Research activities in the Laboratory have benefited from renovations permitted by the Pharmacology-Surgery Program Project Grant, presently in the first year of a five year renewal. Research activities continue to be supported by the PPG as well as by two NIH Grants, a Laboratory Fellowship of the New York Heart Association, and an Established Investigatorship of the American Heart Association. Strong interest in educational activities designed to train young investigators continues, and several surgical residents, medical students and college students have participated in research programs during the past year.

Intensive Care

A major investment of expertise from both the Anesthesia and Surgical Services has continued to focus on the jointly directed Surgical/Anesthesia Intensive Care Unit (SAICU). Drs. Allen Hyman (Anesthesiology) and Thomas C. King (Surgery) provide the primary consultative direction for the full-time professional complement of six residents at various levels of seniority. Sophisticated and complex monitoring equipment and close attending staff supervision have produced an extraordinarily good record of salvage in a wide variety of critically ill patients, many of whom are referred to this hospital with catastrophic surgical complications. The unit is used not only to take care of the critically injured or sick patient, but also for short term prophylactic admissions for selected high risk patients during their early postoperative period. The growing capabilities of our staff surgeons in performing more complex surgical procedures in more critically ill patients, cardiac transplantation for example, make us increasingly dependent upon this unit.

Vascular Laboratory

Now beginning its third year of operation, the Vascular Flow Laboratory has become an established clinical testing unit utilized not only by the Vascular

Surgical Service but by physicians throughout the medical center. With over 1,200 studies performed in 1979, a 100% increase in utilization over the preceding year, the laboratory continues to be an important clinical aid in the diagnosis and treatment of patients with peripheral arterial and venous insufficiency, vasospastic disorders, thoracic outlet syndrome, and extracranial carotid artery disease. The capability for obtaining objective, reproducible plethysmographic and Doppler ultrasound flow studies at the bedside as well as in the PH 12 laboratory with minimal discomfort and no morbidity has added a new dimension to the management of peripheral vascular diseases. Objective criteria have been established for localizing and grading the severity of arterial occlusions; screening criteria for diagnosis of lower extremity deep vein thrombosis have been established with an 80% sensitivity and specificity compared to venography. Oculoplethysmography and carotid phonangiography continue to be useful tests for screening of asymptomatic carotid artery bruits. Together with the development of B mode ultrasound scanning techniques in the Department of Radiology, these studies will significantly enhance the accuracy and clinical utility of noninvasive testing for carotid artery disease.

In addition to expanded clinical activity, the Flow Laboratory, under the direction of Drs. Arthur Voorhees and Roman Nowygrod is participating in ongoing clinical studies of venous disease in critically ill post-op patients, the use of percutaneous transluminal angioplasty in peripheral arterial occlusive disease and the development of functional criteria for patient selection and operative choice in femoral-popliteal occlusive disease.

Emergency Room/Ambulatory Care

Planning for extensive functional and architectural changes in the Emergency Room and Ambulatory Care areas is nearing completion. A short stay surgical unit with general anesthesia and recovery room support facilities planned for VC 3 will expand the limited current capabilities for performing outpatient surgical procedures and will separate this function from the emergency care delivery in Area A. A rapid evaluation department staffed by physicians, nurse practitioners, receptionists and lab technicians will help to expedite and improve triage of the more than 60,000 patients who use the Area A Emergency Room each year. A holding unit contiguous to Area A will provide bed space for emergency room patients who require more than several hours observation or treatment. The V.C. 1 area will be reorganized to streamline patient flow and coordinate activities of the surgical, medical, psychiatric and

pediatric services. Administrative support areas including conference room and housestaff study lounge room have been developed. As these architectural and programmatic changes evolve, efforts to improve patient care through an expanded housestaff coverage and educational program continue with daily patient discussion rounds, invited Area A speaker sessions and monthly Trauma Conferences.

Clinical Affairs Committee

The Clinical Affairs Committee, under the chairmanship of Dr. Alfred M. Markowitz, has been augmented by representation of the nursing staff and administrative staff to provide a forum for both discussion and action concerning the increasingly complex problems of the hospital, the patients, and governmental agencies.

In an attempt to maintain the highest standard of patient care, increasing efforts have been required on all levels of professional endeavor because of the fragmentation of the surgical service into many geographic areas. The aim of the Committee has been, and remains, committed to making the surgical patient's stay in the hospital as pleasant as possible. We are constantly reviewing admission procedures in the administrative portion of the hospital as well as to the hospital floors to make certain that we are doing everything possible to make this an efficient process. We are required to review new forms that are presented on the hospital charts to comply with state regulations and inform the staff of their presence. In addition, we are constantly attempting to maintain a free flow of communication between the nursing and medical staff so that the patient can be better served.

Vascular Service

During the past year, the main thrust of the recently constituted Vascular Service, under the direction of Dr. Arthur B. Voorhees, Jr., has been a training program capable of preparing senior surgical residents for special competence in the recognition and treatment of vascular disease. An integrated diagnostic facility provided by the noninvasive blood flow laboratory, contrast radiology and sonography is of basic importance and has been developed through the cooperation of the Departments of Radiology and Surgery. Through similar support from the Departments of Anesthesiology and Nursing, a specially equipped operating room suite is being developed to provide for intraoperative diagnosis and patient monitoring unique to vascular surgical problems.

The Vascular Service is supported by six attendings who devote much of their professional efforts to vascular surgery and are responsible for the supervision and training of the residents seeking spe-

cial competence. Clinical responsibilities, predominately patient care, have grown over the past five years at a steady rate of 10% a year, reaching over 750 operative cases during the past year.

Research and development activities have lagged during this organizational period and have prompted a record system basic to clinical research and a fellowship program in laboratory research.

Lockwood Service

The Lockwood Service changed character in the middle of the year when the General Surgical Service went from 3 specialty divisions to 2 larger general surgical groupings. The revised Lockwood Service remains under the direction of Dr. Frank Gump and now has twelve attendings and an increased number of residents. All aspects of general surgery are now encompassed within the expanded service which now deals with gastrointestinal, endocrine, breast and vascular problems. Individual surgeons on the Lockwood Service continue work in areas of special interest. Dr. David Habif has continued his research into the possible use of Interferon in the treatment of metastatic breast cancer and is updating our experience with chronic infections of the breast. Dr. Gump and Dr. Michael Sternschein have reviewed the hospital experience with sarcomas of the breast with Dr. Marianne Wolff in Surgical Pathology. Drs. Arthur Voorhees and Roman Nowygrod constitute the vascular surgeons on the Lockwood Service. Dr. Voorhees has continued his collaborative research with Dr. Kenneth Greenspan (Psychiatry) dealing with peripheral arterial control through voluntary control of biofeedback loops. Dr. Carl Feind has maintained his interest in thyroid and parathyroid disease and the use of immunotherapy in the treatment of thyroid carcinoma.

Dr. Thomas King provides expertise in thoracic surgery and is also engaged in a continuing effort to evaluate the effect of bed rest and the associated inactivity on postoperative metabolic alterations. These studies represent an important first step in any program designed to speed postoperative convalescence.

Dr. Bashir Zikria has built up an increasing surgical experience dealing with morbid obesity. Indications for surgery have been expanded now that gastric bypass has replaced the jejunoileal bypass. Stapling instruments have cut operating time of the gastric bypass dramatically and Dr. Zikria has introduced a number of improvements in the basic operation first described by Mason 10 years ago. Gastric bypass reduces food intake without the complications of malabsorption and has increased the safety of obesity surgery.

Whipple Service

The Whipple Surgical Service has continued under the direction of Dr. Alfred M. Markowitz during the past year. It has been a year of marked changes in the character of the Service.

As of July 1, 1979 the Whipple Service was greatly expanded by the addition of several new attendings and residents. The patient responsibility increased some 50% in absorption of additional patients from the Blakemore Service. The Whipple Service now consists of a large general surgical service with patients exhibiting the entire spectrum of surgical disease. This change was thought to be of particular benefit to the medical students who rotate through the Service as clerks. The emergency arm of the Service allows the student to be exposed to the everyday problems facing the general surgeon, namely that of trauma and acute abdominal problems, as well as the more interesting problems of surgical infections.

Drs. Frederic Herter and Alfred Markowitz continue their studies of gastrointestinal neoplasia since many such patients are seen on the Whipple Service, and continue their cooperation with the Cancer Registry which is now under Dr. Avram Cooperman's purview.

Dr. Kenneth Forde's colonoscopy expertise is a vital part of our Service and is used widely by both the patients on the Whipple Service as well as consultation from other services in the hospital.

Newer stapling techniques are continuing to be used in anastomosis of the gastrointestinal tract with the resident staff gaining considerable experience during this past year. A series of several seminars in stapling techniques is to be scheduled during this coming academic year.

Chest Surgical Service

The Chest & Cardiac Surgical Service continued to expand in the area of cardiovascular surgery. With an institutional goal of 800 cases per year, additional operating time has been utilized. Seven hundred open heart procedures will be performed this year. Dr. James R. Malm, Chief of the Service, and his colleagues are preparing final details for the new Open Heart Recovery Room and Operating Rooms to be constructed on the 17th floor of Presbyterian Hospital. This is the only Open Heart Program in New York State which provides total clinical facilities for adults, children and cardiac transplantation.

The thoracic and cardiac teaching program continues to change and improve. Formal preceptor sessions for the students during the clinical year have been modified and replaced with less structured seminars headed by thoracic and cardiac attendings.

Pediatric Surgical Service

The service, under the direction of Dr. Thomas V. Santulli, continues to provide a broad experience in pediatric surgery with emphasis on neonatal and tumor surgery, particularly fostered by the combined programs with the Neonatology and the Hematology-Oncology services of the Department of Pediatrics.

Two electives are offered for the fourth year students, including a subinternship in Pediatric Surgery and an elective in Oncology combined with the Pediatric Hematology-Oncology service.

The role of the spleen in infection and immunologic defenses is still being studied in the laboratory rat model under the direction of Drs. John N. Schullinger and Barbara Barlow. Dr. Howard Ginsburg, Chief Pediatric Surgical Resident, presented our preliminary results at the Surgical Forum of the Clinical Congress of the American College of Surgeons in October in a paper entitled "Impaired Resistance to Infection Following Splenic Irradiation in Rats."

Plastic Surgery Service

The service completed its first complete year under the direction of Dr. Thomas J. Krizek. An expanded clinical experience has been realized. Procedures for reconstruction of the breast after mastectomy and difficult maxillofacial and head and neck reconstructive procedures have increased. New techniques of tissue transfer, including microsurgery, are now regularly performed.

The major emphasis continues to be directed toward resident and student education. In addition to the residents undergoing preparation for certification in Plastic and Reconstructive Surgery, junior general surgical house staff also participate in daily activities. Weekly conferences are presented specifically for students and Dr. Krizek served as a preceptor for students on their general surgical rotation. Among resident activities were the participation of Drs. Frederick Corbin and David T.W. Chiu in the annual Chief Residents meeting in Dallas. Dr. David Chiu also received an Honorable Mention award for his presentation on *Hamartomas of the Digits* at the annual meeting of the American Association for Hand Surgery. Dr. Ronald Feinstein presented a paper on Firework and Firecracker Blast Injuries to the annual meeting of the New York-Brooklyn Committee on Trauma of the American College of Surgeons. Dr. Chiu continues his work on nerve regeneration, Dr. Feinstein is gathering material on infiltrating lipomas of the extremities and Dr. Brad-

ford Edgerton is outlining for publication the plastic surgical aspects of vascular disease.

Faculty activity has also been productive. Dr. Ivo Janecka has established a service to study and treat difficult facial nerve problems. He was also elected to active membership in the Plastic Surgery Research Council. Dr. Bard Cosman was elected President of the New York Regional Society of Plastic and Reconstructive Surgeons. He again presented a course on ear reconstruction at the annual meeting of The American Society of Plastic & Reconstructive Surgeons. He continues his active clinical work evaluating the surgical role of the argon laser in the management of portwine stains and is a regular book reviewer for the *Plastic Surgery Journal*. Dr. Francis Symonds continues his clinical interest in exstrophy of the bladder.

Dr. Thomas Krizek was named co-editor of the *Journal Plastic and Reconstructive Surgery* and completed a 2-year term as Chairman of the Plastic Surgery Training Program Directors Group. He is historian for the American Association of Plastic Surgeons and is a Director and member of the Executive Committee of the American Board of Plastic Surgery and is its representative on the American Board of Surgery. He gave the opening address at the meeting of the Society for Health and Human Values at the annual meeting of the Association of American Medical Colleges.

The Mary Imogene Bassett Hospital

The activities of the Surgical Service continue under the direction of Dr. David Blumenstock. Expansion of the Surgical Attending Staff has been expanded and the availability of a new computerized tomographic head scanner and a linear accelerator in the Radiation Therapy Department have pushed surgical admissions and numbers of surgical operations to an all time high. For the first time in many years, the availability of beds appear to be the limiting factor on further growth.

The surgical residency continues to be directed by Dr. Roger MacMillan. Dr. Bruce MacDonald supervises the student program. Dr. James Bordley IV has the multidisciplinary nutrition service fully operational clinic. The Surgical Oncology Program, under the direction of Dr. John Olson, is expanding its activities.

Dr. David Blumenstock has succeeded in obtaining long-term survival and function of lung transplants in lethally irradiated mismatched beagles. The Heart-Lung Institute has recently awarded three years of grant support to extend these observations to

a mongrel dog population. The Surgical Laboratory is being used for the development of microsurgery and for the training of residents and medical students.

Harlem Hospital

The Surgical Service at Harlem Hospital Center continues under the direction of Dr. Harold P. Freeman. The service performed more than 5000 surgical procedures in the past year. Several key rotations of our residents to affiliated hospitals have augmented our training programs. The service has maintained Board approved programs in General Surgery, Orthopedics, Urology, Plastic Surgery and Oral Surgery.

In June 1979, the Surgical Service sponsored a Trauma Symposium on "Life Threatening Injuries." Dr. Harold Freeman was Course Director. The keynote address on "Fluid and Electrolytes in the Trauma Patient" was given by Dr. Tom Shires. The Harlem Hospital experience in trauma was presented in papers by Drs. David Carberry, Ganepola Ganepola and John Parker.

During the year, the service also sponsored a course "Infectious Diseases as Related to Surgery."

In January, the Harlem Breast Examination Center located in the New York State Office Building was opened, supported by a state grant. This free breast cancer screening center has examined more than 2200 patients, a number of whom have been referred for biopsy. The center stresses the teaching of breast self examination and also serves as an educational and informational source for the public. Mammography is performed on selected patients.

In addition, under a grant from the American Cancer Society, a free cancer screening program has been established within Harlem Hospital to screen for breast cancer, cervix cancer and colo-rectal cancer. It is hoped that through these programs some impact will be made on the severe cancer problem in the Harlem community.

Dr. Lee Eisenberg has been appointed Chief of Otolaryngology at Harlem Hospital and it is anticipated that within the coming year an affiliated ENT Program will be established between the Presbyterian Hospital and Harlem Hospital.

A protocol for organ harvesting has been presented to the Health & Hospitals Corporation and it is expected that this will be approved so that Harlem Hospital can begin obtaining and providing kidneys for possible transplantation. In this undertaking we will be working in close relationship with the affiliated hospitals.

Overlook Hospital

The Surgical Service of Overlook Hospital, with

Dr. Richard Brenner as Director of Surgical Education, continued its program of affiliation with the Department, expanding it in July to include an additional resident from the second year level. Now at any one time, there is one fourth year resident and two second year residents from Columbia as well as one third year and one fourth year resident from the St. Vincent's Hospital and Medical Center program. Now in its fourth year we are enjoying the return of senior level residents we formerly had seen at the junior level. These residents help in approximately 3,500 operations in general vascular and thoracic categories out of the 11,000 total operations.

Two residents from Columbia's Urological program at the fourth and fifth year levels and one 3rd year resident in Obstetrics-Gynecology complete our rotating affiliation. In addition, a number of prospective anesthesia, psychiatric, gynecology and radiology residents at Columbia spend their first year of post medical school training in a flexible program at Overlook, before embarking on full-time specialty programs.

Most of the sixteen general surgeons took part in a trial of having surgeons help in first year anatomy laboratory dissection—a trial which we judge as helping the student understand the practical importance of their findings.

Roosevelt Hospital

The surgical service of The Roosevelt Hospital concluded a very active year under the direction of Walter A. Wichern, Jr., M.D. The primary emphasis continues to be excellence in patient care and the teaching of medical students, residents and fellows.

The volume of clinical material available for teaching remains very high with approximately 14,000 surgical procedures of amazing variety and interest accomplished.

The surgical house staff continues to be of the highest quality and this excellent group of young men and women continue to be a source of great pride. They have assimilated into their services as subintern medical students from the College of Physicians & Surgeons and ten other medical schools in a most effective and stimulating way. A continuing course in surgical technique was given all first year house officers, rotating medical students, as well as those in special need. The attending staff participated in the teaching of anatomy and in the course Introduction to the Patient.

Plans for rebuilding the emergency room have been approved and it is hoped that construction will begin soon. Doctor Stephan Lynn has returned to be director of the emergency room.

October 1, 1979, the St. Luke's Hospital Center

and the Roosevelt Hospital officially merged. This offers great challenge for innovative and creative leadership to aggrandize our surgical strengths and to resolve whatever weakness that might show up. Working together in a cooperative way we have a most exciting opportunity to accomplish much in the immediate future.

Research continues in several areas, in particular in patient monitoring, micro-vascular surgery, joint replacement, and in newer applications of Microfibrillar Collagen. Video tape cassette surgical teaching films of surgical technique continue to be made.

St. Luke's Hospital

The Surgical Service at St. Luke's Hospital Center concluded a most active year under the continuing direction of Dr. Hugh F. Fitzpatrick. Of the 15,515 operations performed at the hospital during 1978-1979, 4,248 were general surgical procedures and of these, 830 utilized total cardiopulmonary bypass principally for coronary artery surgery. The mortality in these patients for coronary bypass surgery alone, not combined with valve replacement or resection of ventricular aneurysms, was an enviable 1.6%.

Our Surgical Training Program has become increasingly popular and there were over 150 applicants for the ten first year positions. The Surgical Service and indeed the entire hospital was deeply saddened by the death of Dr. John P. West on December 1, 1978. Dr. West served the hospital for a forty-five year period interrupted only by World War II when he joined the Second Evacuation Hospital—the St. Luke's Unit.

Dr. William H. Scott, Jr., Professor of Surgery and Director, Section of Surgical Sciences, Vanderbilt University, Nashville, Tennessee, was the William F. MacFee Visiting Professor of Surgery during our Twelfth Annual Postgraduate Course in Surgery.

Fourteen renal transplantation procedures were performed during the year while 95 kidneys were removed from 58 donors and of these 81 were transplanted, a substantial reduction in the wastage of previous years. Surgical Research Laboratories efforts have been focused on approaches for the diagnosis and treatment of human breast and lung cancer, multiple sclerosis and prolongation of kidney allografts.

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Urology

JOHN K. LATTIMER

Professor and Chairman • Director of Service

The Urology Department continues to conduct one of the largest educational and research-oriented Urology Services in the world.

Dr. Lattimer commenced his 26th and final year as Chairman of the Department in the midst of an extra outpouring of historical and scientific data. As of this year, 96 graduates, staff members or former Urology residents have entered academic medicine. Fifteen have become Chairmen of Departments, 5 have been offered Chairs but declined them, and 46 are Associate or Full Professors.

Teaching

Following the overall evaluation and restructuring of the third and fourth year clinical programs, the Urology Department continues to teach small groups of students in two-week rotations, which have been especially well rated by the students. This rotation gives practical urologic clinical experience to all students. Dr. Peter J. Puchner serves as Course Director for both the Clinical Clerkship and the one-month Urology Elective, in which all Squier Clinic attendings participate. The elective continues to be utilized by students from P&S and other institutions to further their knowledge of urology and to explore future career interests.

Attendings and residents from Presbyterian Hospital continue to participate in the urology portions of the first year Gross Anatomy Course in the Medical School and in the Correlation and Introduction-to-the-Patient Courses.

Resident training at Overlook Hospital continues

to be a popular addition to the residency program. During each four-month period, the two residents who are on rotation obtain an important surgical experience at this busy suburban institution. The Journal Club has continued to be a major forum for discussion of current urological topics. Post-graduate education continued under the direction of Dr. John D. Birkhoff. Most departmental rounds and conferences were adapted to the requirements for Category 1, CME Credits. The American Urological Association in-service examination is being used as a criterion of the effectiveness of the program. Dr. Ralph J. Veenema conducts the weekly Urology Tumor Conferences with the resident and attending staff and students. This multidisciplinary conference also involves Uropathology, Radiotherapy and Oncology representatives. Dr. Veenema also revived the Urology Tumor Registry, in cooperation with Dr. M. Wechsler, Dr. N. Romas, Esther Seabron and statistician Dr. Mary Curnen. Dr. Peter De Sanctis has initiated bi-weekly rounds at the Neurological Institute, at which management problems of patients with neurogenic bladders are discussed. In addition, a monthly neurogenic bladder outpatient clinic has been formed and is being run jointly with the Neurology Department. Weekly Grand Rounds, staff meetings and quality control meetings conducted by Dr. Lattimer round out our program. The Meyer M. Melicow Residents' Library continues to enlarge and provides a source of reading and audiovisual material which receives almost continuous utilization from students, residents and attendings.

Dr. David Habif, Jr. (Radiology) became head of the Squier Urological Clinic X-ray Department. He brings with him a broad experience in angiography and radio-isotope scanning and a dedication to urological radiology.

The Uropathology Section, under Dr. Myron Tannenbaum, again conducted a five-day postgraduate review course in Urological Pathology and Radiology, designed to prepare urologists for the second half of the Board Certification Examinations. This course merited 40 hrs. of A.M.A. Category I Credits. Dr. Tannenbaum also conducted a short course in "Surgical Pathology of the GU Tract" at the International Academy of Pathology meeting and a Pathology/Radiology CPC Seminar on Urothelial Tumors at the American Association Annual Meeting.

Dr. Melicow conducted postgraduate uropathology sessions on pheochromocytoma, preparing candidates for the Boards in Urology. He has lectured on "Tumors of Testis," on "Child Victims in History: Chimney Sweeps and the Castrati," in the History of the Health Sciences lecture series, and on "Science and Art: Are They Compatible?" at the History of Pathology Conference. Dr. Melicow was the recipient of the Ferdinand C. Valentine Award by the Section on Urology of the New York Academy of Medicine where he delivered a lecture on "Uro-pathology: Past, Present, and Future." Dr. Melicow was also named a Townsend Harris Medalist at the 99th annual dinner of the Alumni Association of the City College of New York.

In December, the Squier Urological Clinic held its fourth annual Lewis Weikersheimer Visiting Professorship programs. This year's Visiting Professor was Mr. Richard Turner-Warwick, the eminent British urologist who conducted seminars on urodynamics and urethral stricture disease.

Research

The Squier Urology Research Laboratories continued their studies on improving assay methods for prostatic acid phosphatase. Dr. Romas, with Drs. Tannenbaum, Hsu and Tomashefsky have recently developed a new immuno-enzymatic method for the determination of acid phosphatase which combines the immunological methods and the present chemical methods. The method insures that the correct acid phosphatase enzyme is identified by immunological means and it is then measured as to amount, by standard laboratory methods. This combination of chemical and immunological techniques is highly sensitive and specific and does away with the complexities of the radioimmunoassay methods which have proved to be a definite hurdle.

Dr. Tannenbaum continues his extensive ultra-structural studies of human urological cancer cells combining the scanning electron microscope with the transmission electron microscope in studying all segments of the GU system, comparing normal, pre-neoplastic and neoplastic urothelium. With this work as a background, further collaborative projects were with Dr. Patrick Trown, Department of Chemotherapy of Hoffman La-Roche Laboratories in studying the effect of 13 *cis*-retinoic acid and *trans*-retinoic acid on neoplastic urothelial cells in urinary bladders. This study indicated that the retinoid treated animals who were receiving carcinogens, developed smaller numbers of exophytic urothelial tumors in the bladders, after treatment with these medications.

A double blind clinical study under the direction of Dr. Myron Tannenbaum and Mrs. Sheila Tannenbaum has also been undertaken, in collaboration with other faculty members, to measure the effects these retinoids will have on patients with persistently positive findings of cancer cells in the urine.

Studies on the possible role of prolactin in the control of prostatic carcinoma were completed by Dr. Birkhoff in collaboration with Dr. Andrew Frantz in the Department of Medicine. These involved the use of a recently developed rat model for human prostatic carcinoma.

Dr. Melicow is continuing his earlier studies on the origins of tumors of the testis, in light of new findings regarding the important role of the spermatogone as the stem cell and the "embryoid body" as the precursor of non-seminomatous germ cell tumors and studies on tumors of the bladder arising from "carcinoma *in situ*" (nodular tumors) as compared with the papillary growths.

THE USPHS in Staten Island under the direction of Dr. Elliot Cohen has implemented its new Urodynamics Laboratory, using 4-channel A.M.S. equipment, to provide urodynamic evaluation of patients. They are also exploring the field of erectile impotence using a nocturnal penile tumescence monitor. Suitable candidates undergo insertion of the Small-Carrion penile prosthesis.

Similar new equipment has been installed in the Squier Urological Clinic's Physiological Testing Unit, and has been manned by Michael Macfarlane and Dervilla McCann.

Dr. Maria Shevchuk joined the uropathology staff, to help with the increasing numbers of surgical pathology specimens, and to adapt her expertise to some of the attractive problems in uropathology. She is studying the DNA content of condyromata acuminata by microspectrophotometry; the spectrum of the abnormal deposits in muscle biopsies; and the localization of prostate-specific acid phosphatase by

immunofluorescence. She teaches in the uropathology course for the medical students and helps conduct tumor rounds for the urologists. Dr. Shevchuk collaborated with the Obstetrics-Gynecology Department's studies of the histogenesis of common epithelial ovarian tumors, such as the Brenner tumor and the clear cell carcinoma. The CEA content of these tumors and of transitional epithelium, benign and malignant, was studied by the immunoperoxidase technique.

Patient Care

Dr. Longo continues as Chief of Vanderbilt Clinic Urology Out-patient Department which this year gained final approval for implementation of a new clinic facility on the 10th floor of the Vanderbilt Clinic so that the facilities of the Squier Clinic can be consolidated on the 10th floor.

The blueprints have been drawn up to renovate the floor for the future use of the Urology Service, with the conversion of the wards to semiprivate accommodations, plus support space for the Urology Service.

Dr. John K. Lattimer concluded six years as President of the Societe Internationale D'Urologie by conducting the Societe's week-long Congress in Paris. Mayor Jacques Chirac awarded Dr. Lattimer the Great Medal of the City of Paris in recognition of his work in furthering international medical cooperation. Minister Simone Weil honored Dr. Lattimer with a banquet at the Palace at Versailles, where over a thousand members attended. Dr. Lattimer also presented papers on the Repair of Exstrophy at the Annual Meeting of the American Urological Association and was a co-author on Michael Macfarlane's First Prize winning Scientific Exhibit entitled "Exstrophy—The Improved Prognosis in Modern Times." He spoke on long term results with exstrophy at Innsbruck, Austria. Dr. Lattimer was awarded the Foss Memorial Award by the Geisinger Clinic of Danville, Pa., where he gave the founders' day address on cancer of the prostate.

Dr. Terry W. Hensle participated in the Uropathology Post-Graduate Course, run by Dr. Myron Tannenbaum. He also served as Moderator for Post-Graduate Course in Clinical Research, at the American Society for Parenteral and Enteral Nutrition (ASPEN) and was elected Treasurer of the American Society for Parenteral and Enteral Nutrition. Dr. Hensle presented "Testicular Scanning with Thallium 201," at the American Academy of Pediatrics Section on Urology. He presented a paper on Transureteroureterostomy, at the meeting of the Society for Pediatric Urology, was Moderator of the American Urological Association's Post-Graduate Course on Fluids and Electrolyte Balance and Nutri-

tional Support of the Urologic Patient. Dr. Hensle presented part of the American Urological Association's Post-Graduate Course on Undescended Testis and spoke at Maimonides Hospital in New York, Mountainside Hospital in New Jersey and at Long Island Jewish Hospital on Urinary Tract Reconstruction in Childhood and at Lenox Hill Hospital on Surgical Nutrition. He presented a paper on Testicular Biopsy with Acute Lymphatic Leukemia at the New York Section of the American Urological Association, in Innsbruck, Austria. He delivered two talks on Surgical Nutrition at the University of Oregon Medical Center and presented an update on the Care of the Sick Neonate with Genitourinary Anomalies for the American College of Surgeons New Jersey Section at Rutgers University; he spoke at Montefiore Hospital on Urinary Tract Reconstruction in Childhood. Dr. Hensle was appointed Consultant in Pediatric Urology at the Hackensack Hospital in New Jersey.

Dr. Ralph J. Veenema spoke at the Annual Meeting of the American Association of Genitourinary Surgeons on "Immunoassay of Human Prostatic Acid Phosphatase in Bone Marrow." He also discussed a paper on "Intravesical Mitomycin C in the Treatment of Superficial Bladder Tumors." At the Congress of the International Societe of Urologie in Paris, he co-authored a paper presented by Dr. Bruno Fingerhut entitled "An Animal Model for the Study of Prostatic Cancer," and at the Toronto Bladder Cancer Symposium he presented a paper on "Preliminary External Radiotherapy in the Management of Bladder Cancer." He was also a Panelist on the topic of "Advanced Bladder Cancer, Combined Approaches."

Dr. Frank W. Longo, Director of the Charles Lachman Cancer Research Laboratory, in association with Professor Bernard Rivin and Dr. Philip Tomashefsky, has expanded the program of ultrasound in tumor therapy to include breast and prostatic carcinomas. The ultrasound team presented their work at the 7th New England Bioengineering Conference, the International Conference on Thermal Characteristics of Tumors, and the 14th Annual Meeting of the American Association of Medical Instrumentation.

Dr. Peter N. De Sanctis is assisting two fourth year medical students in investigations on sexual performance following orchiectomy and on urinary infections in females. Dr. De Sanctis is also conducting a study in collaboration with the Neurology Department on Shy-Drager disease and its effects on the urinary bladder.

Dr. Peter J. Puchner participated in a panel on "Undergraduate Teaching" at the Annual Meeting

of the Society for University Urologists, where he presented a paper on "Student Objectives in a Urologic Clerkship." He also participated in the meeting of the Committee on Surgical Education in Medical Schools of the American College of Surgeons.

Dr. Myron Roberts served as President-Elect of the New York Section of the American Urological Association and helped to run the 1979 meeting at the Medical School in Innsbruck, Austria.

Dr. Nicholas A. Romas presented a paper on Improved Immunochemical Detection of Human Prostatic Acid Phosphatase, along with a Scientific Exhibit entitled "Counter Immunoelectrophoresis for Detection of Acid Phosphatase" at the Annual Meeting of the American Urological Association. At the Congress of the Society of Internationale D'Urologie in Paris he presented a paper on Immunochemical Detection of Human Prostatic Acid Phosphatase.

Dr. Elliot L. Cohen (USPHS) presented a paper on Cutaneous Manifestations of Carcinoma of the Urinary Bladder at the Annual Meeting of the New York Section, American Urological Association in Innsbruck, Austria and was co-author on a paper entitled "Urologic Complication Related to Abdomino-Perineal Resection of the Colon which was presented at the 27th Annual Meeting of the Kimbrough Urology Seminar. He was also elected President of the Society of Government Service Urologists for 1979.

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International Institute for the Study of Human Reproduction

RAYMOND L. VANDE WIELE

Director

The International Institute for the Study of Human Reproduction consists of two Centers: *A Center for Reproductive Sciences*, directed by Dr. Georgiana Jagiello, and a Center for Population and Family Health, directed by Dr. Allan Rosenfield. The Center for Reproductive Sciences incorporates an interdisciplinary group of investigators in the College of Physicians and Surgeons devoting themselves to the study of the biochemical and physiological aspects of reproductive function. A detailed report of their activities is included in the report of the Department of Obstetrics and Gynecology.

Since its creation in 1975, the *Center for Population and Family Health* has grown in the size of its staff and the scope of its activities. The Center performs an unusual range of functions. In cooperation with the Division of Ambulatory Care of the Department of Obstetrics and Gynecology, the Center's Community-Oriented Reproductive Health Services for Women Unit provides badly needed care to women of the surrounding area. The Center's International Research and Technical Assistance unit works with government and private organizations to improve basic health and family planning services for poor people in developing countries. As a Division of the School of Public Health, the Center gives courses in the field of population and family health, and awards both masters and doctoral degrees. The Social Science Research unit conducts studies and analyzes data on aspects of behavior which affect reproduction. In addition, the Center maintains a full and active library and a statistical unit. The staff of the

Center reflects the interdisciplinary nature of its activities.

Community-Oriented Reproductive Health Services for Women

The Center for Population and Family Health, in conjunction with the Obstetrics and Gynecology Service of Presbyterian Hospital, is in the process of developing a broad range of health and educational programs to address the health and social needs of the people in Washington Heights. Under the Direction of Dr. Allan Rosenfield, the Ambulatory Care Division of the Department of Obstetrics and Gynecology has continued to expand. (See further discussion of the Division's activities in the report of the Department of Obstetrics and Gynecology). Reproductive health and counseling services for adolescents, headed by Ms. Judith Jones, is a key part of the Center's activities. The Young Adult Clinic now has two evening sessions a week, and had 6,000 patient visits in just over two years of operation. The Sloane Evening Clinic begun in May, is providing prenatal, family planning, gynecological and counseling services for both adolescent and adult women.

It is evident from the rates of teenage pregnancy and related health problems in the community that increased preventive services are urgently needed. The Division, in cooperation with other departments, is developing a Comprehensive Adolescent Health Care Program to meet a wide range of medical and social service needs of this often-neglected group. In order to reach these young people, the Center,

through its Health Education Unit, has embarked on an intensive community education program using such tools as a mobile health van, films and flyers, and a community health fair.

International Research and Technical Assistance

With donor support, primarily from the U.S. Agency for International Development (USAID), the Center is working to improve the lives of poor people in developing nations by responding to requests from governments and private associations for technical assistance in the organization, implementation, and evaluation of new and improved approaches to family planning and related health services. Among the current activities of the unit are the following:

Bangladesh: Dr. Henry Elkins continued technical assistance on the assessment of social marketing activities and carried out studies of contraceptive use and traditional rural healers. Dr. Christina Brinkley-Carter and Ms. Joanne Revson completed a case study of the Concerned Women for Family Planning project.

Brazil: Dr. James Foreit gives technical assistance to the private family planning association, BE-MFAM, in designating a state level social marketing experiment and an integrated contraceptive distribution parasite control program, and is evaluating the expansion of community based distribution programs. Drs. John Ross and Martin Gorosh provided assistance on the evaluation of an integrated maternal and child health and family planning program involving a hospital-based postpartum family planning service and outreach program.

Guatemala: Mr. Stephen Isaacs and Drs. Henry Elkins and Jane Bertrand continued technical assistance for the completion of two Center-financed experiments in contraceptive distribution to agricultural workers and their families.

Haiti: Dr. James Allman has become the Center's resident advisor to the Ministry of Health. Dr. Allman and Ms. Revson have continued assistance to the pilot program of household distribution of contraceptives and simple medicaments by specially trained local residents in villages.

Indonesia: Drs. Allan Rosenfield, John Ross, and William Van Wie served on UNFPA missions for needs assessment and project development for the UNFPA family planning service projects in Indonesia. The Center will continue to provide technical assistance for these projects.

Mexico: Mr. Stephen Isaacs, Ms. Michele Shedlin, and Dr. Henry Elkins have continued to render technical assistance to the Ministry of Health in program implementation and evaluation of a large-scale

project designed to bring maternal-child health and family planning services to the rural poor and urban slum dwellers.

Nigeria: Drs. Walter Watson and Nicholas Cunningham and Ms. Joanne Revson consulted with staff of the Department of Obstetrics and Gynecology of the University of Ibadan in the development of an integrated village-based family planning and maternal/child health demonstration project.

Peru: Dr. Walter Torres has been assigned as resident advisor to the Ministry of Health. Dr. Henry Elkins and Mr. Stephen Isaacs provided short-term assistance in the development and evaluation of an integrated health/nutrition/family planning project.

Thailand: Mr. Anthony Bennet works with the Research and Evaluation Unit of the National Family Planning Program, the Mahidol University School of Public Health and the Community Based Family Planning Service (CBFPS) in evaluation of their family planning activities.

Dr. Christina Brinkley-Carter and Ms. Joanne Revson completed a case study of the Nurse's Association of Thailand.

Sri Lanka: Drs. William Van Wie, Walter Watson, Henry Elkins, and John Ross consulted with personnel of the Family Planning Association of Sri Lanka on the design of an experimental social marketing contraceptive service project.

Sudan: Drs. Walter Watson, Giorgio Solimano and Donald Lauro assisted local groups in the development of an integrated community-based distribution demonstration project.

Infant Nutrition Project

Dr. Giorgio Solimano is collaborating in a study of trends and determinants of infant feeding practices, especially breastfeeding, in developing countries. The study will be carried out by a consortium composed of the Center, Cornell University and The Population Council. Elizabeth Kellner is also a member of the Center staff for the project.

Infant Mortality Project

Dr. Solimano is currently developing an international collaborative project to study the relationship of government interventions in health, nutrition, population and social service to trends in infant mortality in three Latin American Cities. Dr. Carlos Montero, a postdoctoral fellow, and Regina McNamara, doctoral student, are assisting on the development of the project.

Teaching

As a Division in the School of Public Health since early 1976, the Center offers full programs of study

leading to master's and doctoral degrees in Population and Family Health. In addition, population and family health classes, courses, and seminars are available to students throughout the Columbia University system. The Division accepts approximately 35 masters and two doctoral students each academic year. During the past year, two doctoral students completed their degrees. At present, over 15 courses are offered by CPFH, and students also have the opportunity to take a wide range of relevant courses in other divisions of the School of Public Health.

Beginning in June 1980, the Center will offer an annual one month training program: "Family Planning, Nutrition and Primary Health Care in Developing Countries: Demographic and Epidemiologic Approaches to Program Design, Management and Evaluation." This short-term training course is designed to teach managers, evaluators and researchers from developing countries the underlying principles, practical techniques and tools necessary for effective integrated service delivery programs.

Social Science Research

The Social Science Research unit complements the Center's other units. During its first two years, the unit has been focused primarily on adolescents. It conducts evaluative as well as more general research on the causes and consequences of adolescent fertility. The Unit is staffed by Dr. Susan Gustavus Philliber, Dr. Pearila Brickner Rothenberg and Dr. Katherine Darabi. Among the projects currently underway are the following: a study of the contraceptive use patterns of teenagers before and after induced termination of pregnancy, and the effects of counseling; an intensive study of the impact of sex education on student, parents, and faculty in a Virginia school; and a study of the effect of maternal age on the parenting behavior of almost 300 women who delivered their first child at the Hospital during 1975. The unit is also beginning to participate in international research on adolescents.

Library

The Center's Library Information Program was established in 1969 to collect, organize, and disseminate materials pertinent to family planning program design, development, and evaluation. Within the past year, the Library has expanded its scope to include unpublished materials relevant to primary health care delivery systems and integrated health/family planning programs. The Library houses a unique collection of over 10,000 documents and 2,000 monographs and contributes to the computerized POP-LINE data base of the National Library of Medicine.

Honors and Services

Dr. Allan Rosenfield was elected Chairperson of the National Medical Committee, Planned Parenthood Federation of America. He was also elected to the Executive Committee and Board of Planned Parenthood Federation of America, the Board of The Alan Guttmacher Institute, the Board of the National Abortion Federation, the Medical Advisory Committee, New York Chapter, National Foundation (March of Dimes), and the Committee on Maternal Welfare of the Medical Society of New York County. He continued to serve on the Board of the American Voluntary Sterilization Association and the Medical Advisory Committee of the International Fertility Research Program.

Dr. Susan Gustavus Philliber was elected to the Board of Directors of the Population Association of America and to the Board of Directors, Planned Parenthood of Rockland County.

Dr. Stephen Isaacs served on the School of Public Health Executive Committee and was Chairman of the School of Public Health Task Force on Core Curriculum.

Ms. Judith Jones served on the Boards of Trustees of Miss Porter's School in Farmington, Connecticut, the Adolescent Health Task Force, American Public Health Association, the Task Force on Minors—National Abortion Federation, The Parent's Committee of Barnard College, and the Women's Forum of New York City.

Dr. Henry Elkins served on the Executive Committee of the International Committee on Applied Research in Population—Latin America (ICAR-PAL).

Ms. Joanne Revson served as a member of the Steering Committee, Working Group on International Women's Programs.

Dr. Pearila Brickner Rothenberg served as Evaluation Consultant to The Door—A Center of Alternatives:

Dr. Katherine Darabi served on the International Planned Parenthood Task Force on Adolescents.

Dr. Giorgio R. Solimano was appointed to the Advisory Board of the Nutrition and Preventive Medicine Task Force, American Medical Association; continued to serve on the Task Force on Food and Nutrition Policy and Program Analysis, World Hunger Program, United Nations University; and was consultant on a project called "Estilos de Desarrollo y Medio Ambiente en America Latina," Economic Commission for Latin America of The United States.

Ms. Kathryn Speert was Membership Secretary of the Association for Population/Family Planning

(APLIC) Libraries, of the Information Centers—International, and a member of the International Activities Committee of APLIC—International.

Ms. Susan Pasquariella was a member of the Research Forums Committee of the Library Research Round Table, American Library Association. She also served on the Board of Directors of APLIC—International and was Chairperson of the Resource and Development Task Force, and a member of the By-Laws Committee.

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Institute of Human Nutrition

MYRON WINICK

Director

Teaching

The Institute of Human Nutrition is entering its eighth year under Dr. Winick's directorship. During this time 125 students have completed the Master of Science program; 16 have earned the Doctor of Philosophy degree and 6 Master's graduates have continued for the Doctor of Public Health degree. A total of 35 postdoctoral fellows have participated in the program. Of the 59 Master's graduates applying to medical or dental schools, 57 have been accepted. Twenty-two graduates of the Master's program have entered the Institute's doctoral program; 6 are in doctoral programs elsewhere, and the remainder of the Master's graduates are in positions related to nutrition and health.

In Autumn this year 12 full time students were accepted into the Master of Science program. Four new students were accepted into the doctoral program, making a total of 23 candidates for the Doctor of Philosophy degree, 16 of whom are graduates of the Master's program. Ten M.S. degrees and 7 doctoral degrees have been awarded this year. Of this number, one is receiving postdoctoral training at Harvard University; one is at Rockefeller University and a third is on the faculty of the University of Iceland. Currently there are 9 postdoctoral fellows in the program.

The Division of Growth and Development continues to cooperate with the teaching programs of various schools of the Health Sciences area. Courses given during the past academic year were: "Biochemical and Physiological Basis of Human Nutri-

tion," for students in the Master of Science in Nutrition program of the Institute of Human Nutrition; "Clinical Nutrition," for the first year students of the medical and dental schools; "Perinatal Nutrition," for the graduate program of the School of Nursing, "Growth and Development," for the graduate program of the Institute of Human Nutrition.

Twenty-two medical students from the College of Physicians and Surgeons and other medical schools did clinical elective work in the Divisions of Metabolism and Nutrition and of Endocrinology at St. Luke's Hospital Center. The Divisions have also been active in providing teaching for graduate students in the Institute of Human Nutrition, including M.S. and Ph.D. Candidates. They continue active divisional teaching for house staff at St. Luke's Hospital Center, including consultation rounds and clinical teaching on the Metabolic Unit.

Clinical Activities

The Divisions of Metabolism and Nutrition and of Endocrinology at St. Luke's Hospital Center continue to be responsible for the operation of the Hospital's five-bed Metabolic Unit and to provide daily consultative services throughout the Hospital Center for patients with metabolic, nutritional and endocrinologic disorders. The Divisions continue to be responsible for ambulatory care through the Endocrine-Metabolic Clinic. Special programs for the study and management of lipid transport disorders and for a multi-disciplinary approach to the treatment of obesity were emphasized. The special program for

weight reduction initiated last year under the aegis of the Obesity Research Center has encompassed the treatment of over 180 patients. Data are being gathered on psychological, behavioral, nutritional and endocrine functions of obese patients.

Research

Dr. Winick and Dr. Brian Morgan have continued their research on the effects of early malnutrition on brain development. During the last year their studies have demonstrated that a reduced brain concentration of N-acetyl-Neuraminic acid is responsible for the behavioral changes observed in adult rats affected by malnutrition during lactation.

Dr. Pedro Rosso's research remains focused on normal aspects of maternal fetal exchange of nutrients and the effects of maternal dietary restrictions. Studies completed during the last year have shown that human placenta transfer of folic acid is a carrier-mediated non-active process while biotin transfer requires both energy consumption and the presence of carrier.

Dr. Nora Haddad-Farkouh is currently involved in the study of the role of the growth hormone receptors in growth disorders. Dr. Farkouh in collaboration with members of the division of growth and development at the Institute of Human Nutrition is studying the mode of action of factors that relate to etiology and pathophysiology of growth failure, by regulating the receptor sensitivity, in altered hormonal and nutritional states.

Dr. DeWitt S. Goodman and his colleagues in the Division of Metabolism and Nutrition have continued to conduct major research activities in the fields of lipid metabolism, atherosclerosis, and the fat-soluble vitamins A and D. A major scientific achievement of the past year, representing the culmination of almost a decade of work in this division, has been the delineation of a confirmed set of predictive equations that describe some of the major parameters of body cholesterol metabolism in intact humans.

Studies dealing with the metabolism and transport of vitamin A have been continued by Drs. John E. Smith, Noriaki Adachi, Mary Ann Gawinowicz, David Sklan (a visiting scientist from Israel), and Goodman.

Information has been obtained about the turnover and metabolism of DBP (the plasma protein responsible for vitamin D transport) in normal human subjects, and about the effects of various chemical modifications of the structure of DBP upon its binding properties for 25-hydroxyvitamin D.

The studies on lipid metabolism and atherosclerosis in the Division of Metabolism and Nutrition comprise a major part of the program of the Specialized Center of Research (SCOR) in Arteriosclerosis.

In the Division of Gastroenterology and Nutrition, Dr. Anderson's studies of the role of intravenous lipid emulsions in parenteral nutrition of premature infants are nearing completion. The research of Drs. Heird, Winters, Nicholson and Dell concerning parenteral amino acid requirements continue as do the studies of Drs. Heird and Winters concerning the effect of quantity and quality of caloric intake on nitrogen retention during parenteral nutrition. Studies of the metabolism of intravenously administered fat emulsions are also in progress. Dr. Heird, with Dr. Michael Malloy, (Postdoctoral Fellow), continues studies of grain growth and development in puppies fed exclusively by the parenteral route. New animal studies instituted over the past year include studies by Dr. Heird and Dr. Steven Schwarz (Postdoctoral Fellow) concerning the role of colostrum in intestinal mucosal growth of newborn beagles.

In the surgical metabolism program, Drs. Kinney and Elwyn are studying the effects of trauma, sepsis and fasting on the free amino acid pattern in human muscle. The effects of diet on these patterns is also being investigated.

Dr. Van Itallie has continued to investigate the usefulness of an electromagnetic instrument for the measurement of lean body mass and body fat content of human subjects. Together with Drs. Colt, Pierson and Wang, Dr. Van Itallie participated in a study of the intracellular potassium of obese human subjects.

Dr. Sami Hashim and Dr. Phienvit Tantibhedhyangkul have shown that weanling rats, reared on MCT-rich diets providing 50% or 70% of dietary calories for periods up to 28 weeks, are significantly less obese and contain smaller sized and lesser number of adipocytes than control animals fed long chain triglycerides (LCT). Dr. Hashim collaborated with Dr. Steven Ryan in studies involving the isolation, characterization and quantification of the pulmonary surfactant system of the lung.

Dr. F. Xavier Pi-Sunyer, in collaboration with Drs. K. Reemtsma, C. Weber, and M.A. Hardy (Surgery) continued studies of the efficacy of pancreatic islet transplantation. They have shown that organ culture of islets for 6 to 8 days before transplantation is feasible, allowing survival of the endocrine tissue while diminishing the exocrine. With Drs. H. Kissileff, J. Thornton, and G.P. Smith, Dr. Pi-Sunyer has shown that cholecystokinin is effective in decreasing the duration of a meal and therefore food intake in normal lean volunteers. In concurrent studies conducted with Ms. R. Woo, no such effect has been found with insulin. With Ms. S. Fried, Dr. Pi-Sunyer has reported that two inhibitors of fatty acid synthesis in the adipocyte did not affect insulin binding of transport but inhibit insulin stimulated glucose utilization. These data provide direct evi-

dence that a reduction in the rate of fatty acid synthesis decreases the insulin effect on (1-¹⁴C) glucose oxidation and total glucose oxidation in fat cells.

Dr. Robert S. Bernstein has been studying factors which influence the insulin sensitivity of adipose tissue in overnight culture. He has looked at effects of human serum and various protein fractions on glucose utilization and lipolysis in this system. With Mr. K. Zimmerman and Ms. A. Carney he has determined that the insulin insensitivity induced by high fat, low carbohydrate diets is specifically due to the fat content. With Drs. J. Feibusch, J. Barbosa-Saldivar and G. Robertson he has described the first case of nephrogenic diabetes insipidus induced by a malignant tumor (metastatic leiomyosarcoma to the liver).

Dr. Harry Kissileff, continuing his work with the universal eating monitor to study cumulative food intake curves during single course meals in man, has shown that the initial rate of eating is augmented following 21 hour food deprivation and that the rate of deceleration during that meal is also increased. This work indicates that the cumulative intake curve is sensitive to experimental manipulation and work is continuing to enable interpretation of the changes in the cumulative intake curve following manipulation of diet palatability and preloads of food.

In work with animals Dr. Kissileff has shown that dietary dilution and taste change interact in such a way as to prevent the normal increase in intake to a diluted diet when it is adulterated with a concentration of quinine that fails to effect intake in a concentrated diet. Taste factors assume a more dominant role in controlling food intake as the diet becomes less concentrated in nutrients.

Drs. Kissileff and Pi-Sunyer have shown that the octapeptide of cholecystokinin decreases food intake in man.

Dr. Joseph R. Vasselli has come to the Obesity Research Center this year with a 3 year NIH grant to investigate the behavioral and metabolic correlates of genetic obesity. He is currently conducting studies on the onset of hypercellular obesity in the genetically obese Zucker rat, and on the relationship between metabolic alterations accompanying hypercellular obesity and changes of food intake, food motivated behavior and sheet preference during growth and adulthood in the fatty rat. Dr. Vasselli and his co-investigator Dr. M.R.C. Greenwood have demonstrated that lifetime caloric restriction of the fatty rat does not prevent lipid deposition or reduce hunger levels in this animal, and are now testing pharmacological and dietary agents which may reduce these undesirable characteristics of hypercellular obesity.

Honors

Dr. Winick was elected chairman of the newly formed section on Clinical Nutrition of the New York Academy of Medicine. He was also an invited speaker at the 11th International Summer School of Brain Research organized by the Netherlands Institute for Brain Research and at the 5th Asian and Oceanic Congress of Neurology. In addition, Dr. Winick was invited to the International Symposium organized for the dedication of the Child Research Center in Warsaw, Poland. Dr. Winick was a special lecturer at the Institute of Health of the Chinese Academy of Medical Sciences in Peking, China.

Dr. Rosso was invited to participate at a Symposium on the role of the placenta in maternal and fetal nutrition sponsored by the American Institute of Nutrition during the Annual FASEB Meeting. He was also a speaker in one of the plenary sessions of the Annual Meeting of the Society for Pediatric Research. In addition, Dr. Rosso was a special lecturer at the International Nutrition Course organized by the University of Nancy, France and a Visiting Professor in the Nutrition Program of the University of Puerto Rico.

Dr. Goodman was elected Chairman of the Council of Arteriosclerosis of the American Heart Association. He was appointed a member of the Arteriosclerosis, Hypertension and Lipid Metabolism Advisory Committee of the National Heart, Lung, and Blood Institute. He was also appointed a member of the editorial board of the *Journal of Biological Chemistry*.

Dr. Van Itallie began his duties as Editor-in-Chief of the *American Journal of Clinical Nutrition*. He also continued work as a member of the National Arthritis, Metabolism and Digestive Diseases Advisory Council. He served as a member of the Task Force on Dietary Factors in Relation to the Nation's Health and edited the supplement to the *American Journal of Clinical Nutrition* in which the proceedings of the symposium presented by the Task Force were published. Dr. Van Itallie also continued to serve as Chairman of the Committee on Medical Sciences of the Board of Trustees of the American University of Beirut.

Dr. F.X. Pi-Sunyer was the recipient of a Senior International Fellowship of the Fogarty Center (NIH).

Dr. Robert Bernstein was elected Vice-President of the Clinical Society of the New York Diabetes Association.

Other Activities

The Eighth Annual Symposium on Nutrition was held in New York in November with over 800 physi-

cians and health specialists in attendance.

The Fourth Annual W.H. Sebrell Lecture was given by Professor Arvid Wretling, Head, Vitrum Institute for Human Nutrition, Stockholm, Sweden.

Donors

American Medical Association, Borden Founda-

tion, Inc., Coca Cola Company, Ford Foundation, Inc., H. J. Heinz Company, Hudson Pharmaceutical Corp., King, C.G. Fellowship Fund, National Dairy Council, National Foundation, National Institutes of Health, Sebrell, W.H. Scholarship Fund, Sugar Association, Weight Watchers Foundation, Inc., Whitehall Foundation, Inc.

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Health Sciences Library

RACHAEL K. GOLDSTEIN

Health Sciences Librarian

While 1979 was a period of administrative transition, it was also marked by continued growth in library use and activities. In October, Rachael K. Goldstein, Director of the library at Mount Sinai School of Medicine of the City University of New York, became Health Sciences Librarian. During the eleven months since the departure of C. Lee Jones, Fred Pheulpin had served as Acting Health Sciences Librarian in addition to fulfilling his responsibilities as Head of Acquisitions. Entering a new decade, a major challenge for the Health Sciences Library will be the incorporation of advances in automation while continuing the high standards this library has set in providing service and access to information resources that meet the changing teaching, research and patient care programs of the entire Medical Center.

Collection and Services

In developing library collection resources to meet the needs of all CPMC teaching, research, and patient care programs, we continue to experience the pressures of inflation. The acquisitions budget barely allows the Library to keep pace with rising costs and the expanding rate of publication. In 1979 the average cost per book increased 12% while journal costs rose more than 15%. We received 2,975 journal titles. The number of books purchased decreased although total book acquisitions remained essentially stable due to the large number of gifts received (about 40% of all books added to the collection). While gift monographs cannot replace new purchases, a substantial number that are current help broaden the collection's scope.

Users and staff experienced the full effect of an automated serials control system beginning in the spring of 1979 when work was completed on entering information on all currently received serials into PHILSOM, a cooperative serials network administered through the Medical Library Center of New York. A major benefit of this system is a new serials catalog for the approximately 3,000 journal titles currently received in the Health Sciences Library. Updated reports incorporating new issues received are cumulated on a daily, weekly, and monthly basis. These reports are available for consultation in several locations in the Health Sciences Library and are also distributed to other Columbia University libraries. Additional advantages of the PHILSOM system include administrative reports that improve internal operations such as prompt claiming of missing issues. The other serials catalog available for user consultation lists all journals, both current and old, in the Health Sciences Library.

The Cataloging Section made the transition to on-line computer operations in 1978, and experienced further improvements in cataloging through the use of RLIN (Research Libraries Information Network) in 1979. By participating in this information network, services that no single library could provide alone are available to all on a cost-effective basis. These include cooperative collection development, shared cataloging and card production, creation and operation of sophisticated information tools, and facilitated access to collections of participating institutions through interlibrary loans. A new Zentec terminal, with "full face," rather than line-by-line mode, pro-

vides for faster and more efficient processing of additions to the library's collection. In the next few years further system additions and improvements will affect the Health Sciences Library operation by increasing the overall quality and scope of information on resources essential for advanced levels of study, teaching, and research. Also anticipated is the replacement of the familiar card catalog format by microfiche catalogs and, eventually, by on-line catalogs.

The Reference Section provides information service, administers the interlibrary loan unit, and offers instruction in use of the Library to faculty and students. During 1979 nearly 20,000 queries from readers were handled. Computerized data base searching of the literature has become a major function with approximately 1,500 bibliographies produced on demand during the year.

Participation in a variety of national and local networks is vital as it enables the Library to function as an access point to information and research resources throughout the U. S. and abroad. In 1978/79 the Health Sciences Library borrowed 1,116 items from non-Columbia libraries and 432 items from other Columbia libraries for a total of 1,548 items borrowed. In response to 11,356 requests, the Health Sciences Library supplied 8,054 items to non-Columbia libraries and 585 to other Columbia libraries for a total of 8,639 items provided on interlibrary loan. Use of the entire Library rose during the year, with 81,525 books circulated, an increase of 9.6% over 1978. Library attendance was 283,300, up 10.6% over the previous year. The year was also one of notable growth for the Media Center. Its collection was enhanced especially by the gift of 200 titles from the Columbia University School of Nursing. Total usage of media units in 1979 was up to 16,181; the census of users was up to 15,959.

The Special Collections and Rare Book Room are presently administered by the Reference Section. Thirty scholars visited these collections in 1979. A project to restore and repair about 150 volumes in the rare book collection was begun this year, made possible by a grant from the U. S. Office of Education. Several members of the P&S faculty serve as advisors to the project staff.

In December a major reorganization of the special collections, including the Jerome P. Webster Library of Plastic Surgery, was undertaken. When completed, materials will be more conveniently available to interested scholars.

The Library continued to sponsor the new History of the Health Sciences Lecture Series. Lecturers in 1979 were Edward B. Schlesinger, M.D., William B. Ober, M.D., Meyer M. Melicow, M.D., Erwin

Chargaff, Ph.D., Bard Cosman, M.D., and Steven I. Gold, D.D.S. In addition to several exhibits prepared by library staff in conjunction with presentations in this lecture series, the first exhibit by an outside artist was held in the Library in September. Displayed in the Lobby and on the walls of the Media Center were 35 photographs by Jim Nickel of St. Louis.

In July the Health Sciences Library hosted a reception for participants in the 31st Congress of the International Psycho-Analytical Association who came to view the Freud Collection, currently housed in the Geraldine McAlpin Webster Special Collections Room. The reception was co-sponsored by the Center for Psychoanalytic Training and Research.

Along with the rest of the Medical Center, the Health Sciences Library began some experimentation in lighting to conserve energy. The lighting level was significantly reduced in areas previously overlit, and timers or photosensitive eyes were placed in areas that are used only intermittently. The most appreciated change was in the individual study carrels on Lower Levels One and Two as relocating the bulbs directly over the desk surface in each carrel and removing ineffective fixtures simultaneously improved the lighting for readers and reduced energy consumption.

Library photocopy services had been plagued with problems during the several years of operation by an outside vendor. With the expiration of the contract, the Health Sciences Library took over the complete operation of all photocopy services: the Photocopy Center, which is run by three fulltime staff, as well as the five coin-operated machines available for self-service in various parts of the Library. A reflection of the improved service can be seen in use statistics which are almost double those of the previous year. Copy costs have been maintained at 5 cents per exposure.

In the spring of 1979 two offices on the south side of Lower Level Two were prepared for use by professors emeriti. Although these offices are located within the library, assignments are made by the Vice President for Health Sciences.

Staff Activities and Honors

The Health Sciences Librarian, Rachael Goldstein, was elected to the Nominating Committee of the Medical Library Association. She serves on two other of the national Association's committees and chaired the New York Regional Group of MLA this past year. She is also a member of the Regional Medical Library's Subcommittee on Education, the Resource Development Committee of the N. Y. Met-

ropolitan Reference and Research Library Agency, the Committee on Medical Education of the Association of Academic Health Sciences Library Directors, and the Advisory Board of *Excerpta Medica*.

Carol D. Kasses, Head of Access/Support Services, is Treasurer of the New York Regional Group/Medical Library Association and chairs the International Cooperation Committee of the Medical Library Association. Ellen Nagle, Reference Librarian, was appointed to chair Columbia University Libraries' Professional Review Committee which is charged with implementing professional ranking, peer review, and promotion for the entire University Libraries system. Ms. Nagle also serves on the National Library of Medicine's Standing Committee for On-Line Retrieval Education, and she taught the Medical Library Association's continuing education course on MEDLINE twice this year. Other members of the Reference Section who served on New York Regional Group/Medical Library Association committees are Jane Dorfman on the Continuing Education Committee, Susan Maden on the Executive Committee, and F. William Chickering on the Program Committee. Ms. Dorfman was also on the Columbia University Libraries Representative Committee of Librarians, and Mr. Chickering on the New York Nursing Media Consortium.

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Cancer Center/Institute of Cancer Research

PAUL A. MARKS

Director

RICHARD A. RIFKIND

Co-Director

SOL SPIEGELMAN

Director of the Institute of Cancer Research and Deputy Director for Basic Science Research

ROSE RUTH ELLISON

Deputy Director for Clinical Research and Patient Care

JAMES QUIRK

Deputy Director for Administration

I. BERNARD WEINSTEIN

Deputy Director for Educational Programs

JAMES A. WOLFF

Deputy Director for Cancer Control

In 1979, the Columbia University Cancer Center/Institute of Cancer Research was recognized by the National Cancer Institute as one of the nation's outstanding cancer facilities and was formally designated a Comprehensive Cancer Center.

One of two such facilities in New York City, and one of 21 in the country, the center was designated after careful review of the scope of its interdisciplinary programs in basic and clinical cancer research, professional education and training, patient diagnosis, treatment, rehabilitation, and prevention.

The purpose of the designation is to enhance the center's ability to function as a resource and core unit within a network of institutions dedicated to a

cooperative exchange of information, to the rapid translation of basic research into clinical studies and applications and to regional planning of cancer control activities. The recognition reflects the long standing commitments to cancer research, education, and patient care throughout the Columbia-Presbyterian Medical Center.

Administration

The Cancer Center's Administration Division provides management of core laboratory facilities which include an animal care facility, a glassware preparation center, an electron microscopy facility, a cytology facility and tissue collection facilities. In

addition, administrative services provided include budget management, grants and contracts management and personnel.

The Cancer Center, in cooperation with the Presbyterian Hospital Tumor Registry, began operation of its computerized Patient Research Data Base to be used to improve patient care, teaching and research. The computer-based clinical data display system, MEDGRAF, was extended to cover various neoplastic diseases including breast cancer and myeloma. The Epidemiology-Biostatistics Unit aided numerous investigators in development, conduct and evaluation of both basic science and clinical research projects. In addition, Dr. Joseph Fleiss conducted statistical research into the estimation of the two most important epidemiological measures of the association between exposure to a risk factor and the development of a disease: the relative risk (or odds ratio) which measures the strength of association, and the attributable risk which the proportionate decrease in incidence of the risk factor were eliminated. Dr. Mary Curnen completed the analysis of data collected for the study of cancer in physicians compared with lawyers.

The Tumor Tissue Facilities operate under the direction of Dr. Cecilia Fenoglio (General Pathology) and Dr. Philip Duffy (Neuropathology). Collected tissues are processed and stored for distribution to research investigators. The Cytology Core Facility headed by Dr. Arline D. Deitch collaborated extensively with members of a number of laboratories. For these studies, large numbers of cells in specified parts of the cell division cycle were provided by centrifuged elutriation, while cell cycle changes, cell size and cototoxicity were monitored by flow microfluorometry.

Cancer Control

The Cancer Control Division continues its programmatic cooperation with the New Jersey Cancer Control Network. The Division has entered into a collaborative agreement with the Elizabeth General Hospital in Elizabeth, New Jersey. Elizabeth General Hospital is dedicated to the development of programs, facilities and resources necessary for a broad-based multidisciplinary initiative in cancer control supported by consultative, educational and research resources at Columbia Cancer Center. A full-time, Oncology Director will be appointed at the Elizabeth General Hospital and will also hold a Columbia faculty appointment. Preliminary meetings have also been held with the newly formed Cancer Committee of the Overlook Hospital in Summit, New Jersey.

Extensive educational programs have been developed and made available to the participating hospitals in the Network (Elizabeth General, Overlook, Morristown Memorial).

Clinical Research and Patient Care

Dr. Rose Ruth Ellison has formed numerous interdisciplinary working groups for the development of clinical treatment protocols. Chemotherapeutic studies for stages II, III and IV of breast cancer have been coordinated by a group consisting of Drs. Perloff, Oster, Ellison, Frank Gump (Surgery), Sven Kister (Surgery), Paul Lo Gerfo (Surgery), and Avram Cooperman (Surgery). Studies in ovarian cancer and cancer of the prostate and bladder have also been undertaken in conjunction with Drs. Edgardo Yordan (Gynecology), Henry Clay Frick III (Gynecology), Nicholas Romas (Urology) and Ralph Veenema (Urology). Dr. Martin Oster has the responsibility for studies in head and neck cancer together with Drs. Andrew Blitzer (Otolaryngology) and Maxwell Abramson (Otolaryngology). Drs. James Halper, Ellison, Garrett (Harlem Hospital), Arthur Karanas (Roosevelt Hospital) and Daniel Knowles (Pathology) are now coordinating treatment plans and correlation of these with marker studies in patients with lymphoma.

Dr. Halper, together with Dr. Knowles (Pathology) has instituted a program to make immunological typing of leukemias and lymphomas available to the Medical Center. Immunological classification has been shown to have prognostic significance. In 1979, specimens from over fifty patients were typed.

Dr. Ellison has identified the use of intensive maintenance therapy as a major factor in providing long continuous remissions in patients with acute myelocytic leukemia. Other expected prognostic features have not been shown to be operative in those patients who receive marrow suppressive treatment with an anthracycline and arabinosyl cytosine.

Dr. Elliott Osserman has continued to direct a coordinated program of clinical and immunological investigations of multiple myeloma and related plasma cell dyscrasias. Dr. Osserman was selected by the American Cancer Society to supervise the multi-institutional study of the therapeutic value of human leukocyte interferon in myeloma. Dr. William Sherman has collaborated in this project, and all CPMC patients have been studied in the Clinical Cancer Research Center and in the General Clinical Research Center.

Dr. Sherman has been trying to confirm the antigenic ligand specificity of a monoclonal IgM associated with peripheral neuropathy. He has partici-

pated with Drs. Siris and Canfield in the study of the effects of dichloromethylene diphosphonate in the management of hypercalcemia of multiple myeloma.

Dr. Halper has studied the expression of two markers, Ia antigens and α -naphthyl acetate esterase, in great detail and compared to that of other markers. It was shown that these markers were useful in identifying different phenotypes in lymphomas from different patients and that the specimens from some patients contained cells with different phenotypes, leading to speculation that lymphomas from these patients consist of cells at different stages of differentiation.

During the course of these studies several antigen binding lymphomas and several lymphomas reactive to mitogens have been identified. The reactivity of these lymphomas are being further characterized in collaboration with Dr. Leonard Chess (Rheumatology).

Drs. Peter Byeff and James Halper have identified several cases of myeloma in which the neoplastic plasma cells and peripheral blood lymphocytes show chromosomal abnormalities. Further studies show characterization of the nature of the cell undergoing malignant transformation in myeloma. Several cell lines with unusual characteristics have been established from myeloma patients and are currently being further characterized.

Dr. Chu H. Chang and his associates have continued research efforts in radiation sensitizers and protectors. Dr. Chang has treated 16 patients with malignant gliomas with a new radiosensitizer (misonidazole) and radiation as part of the TROG cooperative protocol study. Some initial enhanced tumor response has been observed. However, the drug toxicity, includes nausea, vomiting central and peripheral neuropathy are quite marked. Laboratory studies on tissue and tumor distribution of a radiation protector, WR2721, are being initiated for further elucidation of the mechanisms of differential protection and differential sensitization of hypoxic and oxic cells in simultaneous administration of WR2721 and Misonidazole.

With Dr. Leon Harisiadis, Dr. Chang has treated three patients in a series of metastatic melanoma patients with controlled local hyperthermia induced by microwaves. Multiple metastatic subcutaneous melanoma nodules were treated with multiple dose schedules before or after heating at 42-43°C and an encouraging enhancement of tumor regression under the study conditions was observed.

A RTOG national cooperative study on malignant gliomas, of which Dr. Chang is the study chairman, has recently closed for case accrual. A total of 626 patients entered this study. At this time, it appears

that BCNU plus radiation arm does fare slightly better than standard radiation arm alone.

Dr. Richard Edelson has continued his studies of the immunobiology of cutaneous T cell lymphoma (mycosis fungoides, Sezary syndrome and related presentations). With Dr. Carole Berger and Dr. Dorothy Warburton, he has demonstrated that these lymphomas are of monoclonal origin. He has shown that the neoplastic T cells can express membrane receptors for histocompatibility antigens. With Dr. Mark Hardy, he has shown that intravenous anti-thymocyte globulin is efficacious in the management of selected patients.

Drs. Carl Feind and Paul Lo Gerfo are investigating the value of tumor markers in the detection of thyroid cancer. During the past year they have demonstrated that serum thyroglobulin is extremely sensitive in detecting recurrent cancer in the athyroid individual.

Studies of collagenase and invasiveness of head and neck tumors have been carried out by Drs. Cheng C. Huang, Andrew Blitzer and Maxwell Abramson. This project is conducted to measure and characterize a collagenolytic enzyme from a variety of head and neck tumors and to determine the significance of collagenolysis in the invasiveness and clinical behavior of the malignancies in humans and in an experimental rat. Collagenase and protease activities have been compared for anatomic site, size and degree of tumor differentiation. The animal model is used to test whether collagenase inhibition with a specific antibody will decrease tumor invasiveness and improve animal survival.

Dr. Brisman has continued his studies on leptomeningeal carcinomatosis and the use of intrathecal medications.

Cervical intraepithelial neoplasia in diethylstilbestrol exposed female progeny and the natural history of the vaginal and cervical changes which are found in DES-exposed girls and women have been studied by Drs. Ralph Richart and Richard Levine.

The second study is a review of the evaluation of cadaver bone allografts in limb-saving resection-reconstruction for primary malignant bone tumors. Dr. Harold M. Dick and colleagues have completed treatment on twenty-six patients with allograft replacement in conjunction with adjuvant chemotherapy. A review of the evaluation of cadaver bone allografts in limb saving resection-reconstruction for primary malignant bone tumors is underway.

Drs. Austin Johnston and Louis Bigliani have initiated a retrospective review of the diagnosis and treatment of a relatively new sarcoma reported fibrous histiocytoma.

In collaboration with Dr. Richard Edelson, Dr.

Dorothy Warburton has done cytogenetic studies of tumor cells from multiple sites in patients with cutaneous T-cell lymphomas and has established the clonal origin of these multifocal tumors. A malignant T-cell population from one such patient has been demonstrated to respond in mixed lymphocyte culture to multiple HL-A haplotypes, a finding which may be of significance in understanding the basis of the cutaneous tumors found in this disease.

Dr. Myron Tannenbaum continues his extensive ultrastructural studies of human urological cancer cells combining the scanning electron microscope with the transmission electron microscope in studying all segments of the GU system, comparing normal, preneoplastic and neoplastic urothelium. Further collaborative projects were begun in studying the effect of 13 *cis*-retinoic acid and transretinoic acid on neoplastic urothelial cells in urinary bladders. This study indicated that the retinoid treated animals who were receiving carcinogens developed smaller numbers of exophytic urothelial tumors in the bladders, after treatment with these medications. A double blind clinical study has been undertaken to measure the effects these retinoids will have on patients with persistently positive findings of cancer cells in their urines.

Studies on the possible role of prolactin in the control of prostatic carcinoma were completed by Dr. Birkhoff in collaboration with Dr. Andrew Frantz. These involved the use of a recently developed rat model for human prostatic carcinoma.

Dr. Melicow is continuing his earlier studies on the origins of tumors of the testes, in light of new findings regarding the important role of the spermatogone as the stem cell and the "embryoid body" as the precursor of non-seminomatous germ cell tumors and studies on tumors of the bladder arising from "carcinoma in situ" (nodular tumors) as compared with the papillary growths.

Dr. Daniel Linkie and co-workers have focused research on problems in the steroid hormone action field. They continue to be interested in the modulation of steroid availability to target tissues and have been using alphafetoprotein, an oncofetal substance that in the rodent binds estrogens, as a model modulator. They are also studying the early binding events of steroid with its specific receptor once entrance to the cell has been obtained and have recently turned their attention to steroid receptor-acceptor interactions.

Dr. Sadek Hilal has completed an inter-institutional study for the review of the efficacy of CT in detecting brain tumors. They have reviewed 362 gliomas examined over a five-year period. Each patient was followed up to death or a minimum of three

years. CT presented the first opportunity to study the exact size of a neoplasm noninvasively *in vivo*. It was possible from this study to establish a correlation between tumor size measured on the enhanced CT scans and longevity. The concept of tumor burden becomes a major factor in the prognosis. Tumors measuring more than 2000 mm² in crosssectional area had a uniformly low prognosis regardless of the treatment. It is interesting to note that the results obtained from the five collaborating institutions correlated very well, indicating that there is little regional variation in the biological behavior of the malignant gliomas.

Chemical Carcinogenesis

Dr. I. Bernard Weinstein and his associates have continued their studies on the molecular and cellular mechanisms of action of chemical carcinogens. Studies done together with Dr. Dezider Grunberger and Dr. Alan M. Jeffrey have focused on the structural and functional changes in DNA when it is modified by the ubiquitous environmental carcinogen benzo(a)pyrene. Cell culture studies on the mechanisms of action of the phorbol ester tumor promoters have provided evidence that they: 1) induce phenotypic changes that mimic those seen in tumor cells, 2) are potent modulators of differentiation, 3) alter the function of cell surface receptors for growth factors, and 4) enhance the transformation of cells by oncogenic viruses. These results provide insights into multifactor interactions and multiple steps in the action of environmental carcinogens. Rapid *in vitro* bioassays have also been developed for the detection of chemical carcinogens and tumor promoters in the human environment.

Dr. Alan Andrews continues work designed to elucidate the molecular nature of human DNA repair processes and the role of these processes in environmentally-induced disease, especially skin cancer. The work involves the study of cultured cells from patients with genetic deficiencies in DNA repair capacity, i.e. primarily patients with xeroderma pigmentosum or Cockayne's syndrome. Our efforts are directed at measuring the rates of repair of several kinds of DNA damage in these cells, measuring the susceptibility of such cells to induction of mutations and malignant transformation, and correlating such measurements with the clinical characteristics of the patients from whom the cells were derived.

Dr. Leonard Harber and colleagues have continued to test chlorpromazine and protriptyline in a red blood cell photohemolysis system.

Dr. Alvin I. Krasna's laboratory has continued the development of biological and synthetic systems for the cleavage of water by solar energy to form hydro-

gen and oxygen. Hydrogen is an ideal clean fuel and its production from water and sunlight would ease the energy problem. The laboratory has also been studying the regulation of the enzyme hydrogenase in microorganisms and is seeking to isolate mutant forms of the enzyme.

In collaboration with Dr. B. Lewis, University of Toronto, Dr. P. R. Srinivasan has been evaluating the various parameters that affect gene transfer in mammalian systems with chromosomes or DNA as the vector.

Viral Oncology

Dr. Harold S. Ginsberg and colleagues are investigating the regulation of adenovirus replication and viral gene products that affect viral transformation. A wide range of conditionally-lethal temperature-sensitive (ts) mutants isolated in his laboratory were used in these studies. Particular emphasis has been placed upon studying: the regulation of early transcription; the nature of viral DNA integrated in cells transformed by ts mutants (H5ts125 and ts107) which transform cells at a frequency 5 to 10 times greater than wild type virus; and the failure of chemical carcinogens and tumor promoter to alter the integration of viral DNA although transformation frequency was increased by these chemical agents; the regulation of viral gene expression in transformed cells containing the entire adenovirus genome; the regulatory role of a viral non-structural protein in the assembly of the major capsid protein, the hexon; the search for temperature-sensitive mutants in previously unaffected viral genes using type 7 adenovirus; and development of methods to obtain site-direct mutants.

Dr. Cecilia Fenoglio has continued her collaborative studies on the inter-relationship between neoplasia and latency with respect to herpesvirus. These studies are aimed at the detection of herpes-specific messenger RNA and herpes-specific antigens in cervical tissues as well as in ganglia and peripheral nerves.

Dr. Ramareddy Guntaka and his colleagues have concentrated on studies about methylation of avian tumor virus DNA in permissive and nonpermissive cells. They have demonstrated extensive methylation of cytosine residues in the integrated proviral DNA from nonpermissive rat cells as well as the endogenous viral sequences in permissive chick cells.

The focus of the research of Dr. Ann Henderson is the determination of a) the gross physical map position of integrated virions in human chromosomes and the distribution of such positions among cell lines descended from independent integrations and b) quantitative and distributive changes in iterated se-

quences in host cell chromosomes as the result of malignancy and the possible effect of such changes on chromosomal rearrangement. She has used hybridization *in situ* to identify DNA homologous to the Epstein Barr virus (EBV) genome in identified chromosome regions of appropriate cell lines.

Drs. Fred Kramer and Donald Mills continue to concentrate their efforts on understanding the mechanism of RNA synthesis by Q β replicase and on the development of techniques for the modifications of the structure and function of RNA molecules. They are also investigating other nucleic acid polymerases to assess the universality of different aspects of the replication process. They have successfully achieved their goal of developing a rapid procedure for sequencing RNA molecules. They discovered that all rapid nucleic acid sequencing procedures were subject to distortion by the persistence of secondary structures during electrophoresis.

The laboratory of Dr. Saul J. Silverstein and his colleagues has pursued its interest in introducing familiar genes into strange places. They have recently demonstrated that cells which retain the virus gene but do not express it have methylated the DNA sequence about the gene. This is direct evidence for a type of epigenetic regulation in higher eukaryotes. Additional studies have focused on the production of a dominant acting eukaryotic vector with the intent of introducing any foreign gene into eukaryotic cells. They have introduced globin genes in Friend erythroleukemia cells and human growth hormone cells into a rat liver cell line. In each instance the recipient cell lines can be stimulated to produce a related naturally occurring product from endogenous template.

Dr. Spiegelman and his colleagues have made significant progress in their effort to devise a diagnostic signal for human breast cancer. They had previously demonstrated that human breast cancer cells contain a protein unique to this malignancy and one that crossreacts with gp52, a 52,000 dalton glycoprotein found in mouse mammary tumor virus. They have developed a highly specific procedure for detecting both primary and metastatic lesions in tissue sections. This has been successfully employed by surgical pathologists to diagnose ambiguous cases and to detect microscopic tumors which might have been missed by the usual examination methods employed. Two clinical parameters have been identified as correlates of high levels of this antigenic signal. One is a positive family history of breast cancer and the other is the aggressiveness of the disease. Specific reagents are being devised using the purified human breast cancer antigen and hybridomas. These will be employed to develop a sys-

temic diagnostic signal for this antigen in the plasma of breast cancer patients, a possibility which has been fully realized in the mouse mammary tumor model.

Dr. Hamish Young is investigating the mechanism of recombination in human adenoviruses and the effects of tumor-promoting agents upon adenovirus replication. In collaboration with Dr. Silverstein, it has been shown by blotting-hybridization techniques, that the intra-cellular concentration of recombinant DNA molecules, relative to parental molecules, increases during the exponential phase of viral DNA replication. They have obtained recent evidence that suggests that even in the absence of gross DNA synthesis recombinant DNA molecules can form.

Cancer Immunology

Dr. Elliott Osserman and his colleagues have pursued investigations to determine whether certain monoclonal immunoglobulins in myeloma and other plasma cell dyscrasias have their specific antigens and/or structurally related ligands already bound in their combining site(s) in their native, *in vivo* state. In one case, IgG^{Gar}, which binds riboflavin, this has been conclusively established. Detailed physico-chemical studies of IgG^{Gar} are being pursued in collaboration with Prof. Sherman Beychok (Biological Sciences). Determination of the amino acid sequences of the heavy and light chains of IgG^{Gar} is being done in collaborative studies.

The pathogenic mechanisms in a group of patients with diverse neurological disorders, particularly polyneuropathies, associated with monoclonal gammopathies are being defined in collaborative studies. A clinical trial of plasmapheresis has been carried out. The monoclonal proteins from five of these patients have been studied. Two of the five proteins have antibody-like activity against preparations of myelin, as demonstrated by complement fixation and/or immunoprecipitation.

Dr. Osserman has continued his investigations of the enzyme, lysozyme, which is a major product of monocytes and macrophages. A principal question has been whether lysozyme affect specific glycoproteins or polysaccharides in mammalian cells and whether it participates in certain of the diverse immunological formations of monocytes and macrophages. The results of recent studies provide strong evidence in favor of this postulated role of lysozyme. Specifically, lysozyme has been shown to markedly enhance monocytedepleted mixed lymphocyte reactions. Lysozyme may therefore be an important mediator of the interactions between monocytes and lymphocytes in immunological functions. Further studies of the effects of lysozyme on these phenomena are being pursued.

In the laboratory of Dr. Andrei Augustin, he and his colleagues are pursuing the expression of idiotype-like determinants on antigen specific, MHC-restricted helper cells; the T cell induced polyclonal activation of B cells and the involvement of T cells in the induction of immunoglobulin switch; and functional studies on the thymus epithelial cells in long term culture aimed at understanding their role in the generation of diversity of T cell receptors.

Dr. Arthur Bloom and his associates have focused on two major projects. In the Cayman Islands, they have identified the lethal form of mucopolysaccharidosis present in one village as a variant of the San Filippo A disease, and have initiated studies into the etiology (?viral) of the new disease they have defined there in 27 patients, the so-called Cayman disease (cerebellar ataxia from birth, mental retardation, abducens palsy). In chemical mutagenesis, they are using cultured Chinese hamster ovary cells and studying the effects of known or putative mutagens in terms of sister chromatid exchange formation and chromosome breakage, indirect measures of mutagenicity.

Dr. Leonard Chess is investigating the differentiation history of human T cells and is particularly interested in isolating subclasses of human T cells important in the regulation of the immune response. In this regard efforts are being directed to the identification of distinct and unique differentiation antigens which distinguish subclasses of lymphocytes and which may allow for their identification and isolation for immunologic functional analysis.

Dr. Bernard Erlanger carried out research on the presence of DNA receptors on cell membranes. With his associates, work has been completed on antibodies to the oligonucleotides sequences AA(U)_n (n+1-4), during which improved procedures for the synthesis of oligonucleotides were developed. These results provide information about the antibody binding site and the conformations of the nucleotides, and also provide crucial information needed to develop immunological probes of more complex sequences in nucleic acids. Work has continued with highly specific antibodies to 7-methylguanosine-5'-PO₄ to study properties of messenger RNA, its regulation and the conformation of the 7-methylguanosine cap at the 5' end of m-RNA.

Dr. Steven M. Friedman's laboratory is intimately involved in studying the mechanisms by which T lymphocytes recognize foreign or altered-self cell surface determinants and subsequently differentiate into killer cells capable of destroying these foreign cells. Moreover, Dr. Friedman is studying the mechanisms by which, under certain experimental conditions and in some diseases in man, these same T cells

become autodestructive and destroy unaltered normal cells. In addition, Dr. Friedman is actively investigating the mechanisms by which human antibody-forming cells become unresponsive (tolerant) to given antigens. The breakdown in tolerance to one's own cells is one of the mechanisms thought to be important in some of the rheumatic and autoimmune disorders.

Dr. James Halper and associates have identified several antigen binding B cell lymphomas and several lymphomas of T cell origin reactive to mitogens and allogeneic cells. The reactivity of these lymphomas are being further characterized in collaboration with Dr. Chess.

The laboratories of Dr. Elvin A. Kabat have continued research in the following major areas: The structural and genetic basis of antibody complementarity, mapping of the combining sites of antibodies and lectins, preparation of monoclonal antibodies to dextrans and to concanavalin A by the hybridoma technic, measurements of binding constants of homogeneous antibodies by affinity electrophoresis, elucidation of the structure and specificity of the water soluble blood group A, B, H, Le^a and Le^b, I and i glycoproteins, and on the antigenic properties of oligosaccharides coupled to fatty acid amines.

The second edition of the book *Variable Regions of Immunoglobulin Chains*, has been expanded to include precursors, constant regions, J and β_2 microglobulin and retitled *Sequences of Immunoglobulin Chains*. The number of amino acid residues sequenced in the variable region alone is now 26,108 for light chains and 11,147 for heavy chains, an increase of 50 percent since the first edition appeared in 1976. The information has provided evidence of Mendelian independent assortment of the framework and complementarity determining regions which make up the variable region and Drs. Kabat, Wu and Bilofsky have put forward the hypothesis that antibody diversity is generated somatically during differentiation by the assembly of nucleotides coding for these segments into complete V-region genes; the nucleotide segments being called minigenes. At least one DNA segment, the J segment coding for amino acids 96-107, has clearly been shown to be joined to the DNA coding for amino acids 1-95 between the twelfth day of embryonic life and the adult myeloma protein and each of these DNA segments has been shown to be flanked by an intervening sequence in cloned 12 day mouse embryo DNA. Thus the J segment is clearly a minigene and the assortment principle has been adopted by other groups of workers in examining sequences.

Dr. Daniel Knowles has continued 1) The investigation of cytochemically demonstrable lysosomal

enzyme activities as useful markers of lymphoid subsets, 2) The immunologic characterization of the extra-nodal lymphoid neoplasms. He has also begun, with Dr. James Halper and Dr. Leonard Chess (Medicine), a series of long range investigative studies in the area of T cell differentiation. Funding has come from two NIH grants. During this same period of time, his laboratory has also functioned as a cell surface marker laboratory for the hospital, on an informal basis.

Dr. Benvenuto Pernis and associates have concentrated on the study of the expression and the regulation of the idiotypes corresponding to the PCD that produce monoclonal IgM proteins with anti- γ globulin activity. As a result of these studies, it appears that B cells marked by cross-reacting idiotypic (CRI) are present in small numbers in normal individuals and that they become much more numerous in patients with rheumatoid arthritis. Furthermore, it appears that very small concentrations of anti-idiotypic antibodies are quite efficient in achieving the suppression of the CRI *in vitro*.

Cellular and Molecular Genetics

Dr. Richard Axel and his associates developed transformation systems which may allow the introduction of virtually any defined gene into cultured cells. They have therefore performed a series of transformation experiments with a variety of different eukaryotic and prokaryotic genes: 1) to develop *in vivo* systems to study the functional significance of various features of DNA sequence organization; 2) as a means for gene purification where now classical routes involving recombinant DNA technology and molecular hybridization are inapplicable; 3) to examine the fluidity and promiscuity of the eukaryotic chromosome.

They have stably transferred a number of genes coding for selectable biochemical functions such as thymidine kinase to mutant mouse cells. The isolation of cells transformed with genes which do not code for selectable markers, however, is problematic, since current transformation procedures are highly inefficient. Recently, however, they have demonstrated the feasibility of co-transforming cells with two physically unlinked genes. Co-transformed cells can be identified and isolated when one of these genes codes for a selectable marker. We have used the viral tk gene as a selectable marker to isolate mouse cell lines which contain the tk gene along with either bacteriophage ϕ X174, plasmid pBR322, or the cloned rabbit β -globin gene sequences stably integrated into cellular DNA. They have further demonstrated that the gene coding for the rabbit β -globin in transformed mouse fibroblasts is properly recog-

nized by the transcriptional and processing enzymes of the mouse cell to generate RNA indistinguishable from the mature globin mRNA of the rabbit erythroblast. These studies demonstrate the value of co-transformation systems in the analysis of eukaryotic gene expression.

The laboratory of Dr. David H. Figurski is working to learn the basis for the uniquely broad host range of the Inc P-1 group of bacterial R-plasmids. From gene cloning experiments, it has been determined that four distinct segments of the genome of one such plasmid, RK2, code for functions that interact to permit normal maintenance and replication of the plasmid in *E. coli*.

The work in Dr. Reba Goodman's laboratory is concerned with the regulation and control of gene expression, and they are presently engaged in determining the cytological and biochemical events which accompany hormonal and heat shock induction of transcription.

Drs. Orlando J. Miller, Dorothy A. Miller and Ramana Tantravahi, have demonstrated a marked increase in the number of copies of the ribosomal RNA genes in a rat hepatoma line, and are investigating the possibility that this kind of gene amplification, which would enhance cell growth rate, may be important in the origin or progression of tumors. It has been shown that the tumor dormant state does not involve hybridization of tumor cells with host cells. They have demonstrated suppression of the human ribosomal RNA genes in rat-human hybrid cells have shown that similar suppression of human rRNA genes in mouse-human hybrid cells occurs rather slowly, with the development of an imbalance between mouse and human chromosomes.

Cellular Development

Drs. Paul A. Marks, Richard A. Rifkind and Roberta Reuben have explored changes in erythroleukemia cells which may be critical to the program of induced-differentiation. Changes in DNA-structure and chromatin are implicated and a period during G1-early S phase of the cell division cycle appears critical for subsequent globin mRNA synthesis.

Dr. Arthur Bank has continued his studies of the structure and organization of normal and abnormal human globin genes. With his colleagues he has recently isolated β and γ globin genes from β^+ thalassemia patients by recombinant DNA technology, and has shown that the two γ globin genes in man are linked on a single fragment of DNA and separated by 3.5 kilobases. Polymorphisms in human DNA have also been demonstrated using this technology.

Thyroidal regulation of the Na⁺ pump: Dr. Isi-

dore Edelman and his colleagues have had significant progress in developing isolated cell systems (e.g. mouse fibroblasts) in tissue culture that retain responsiveness to thyroid hormone. Neoplastic transformation of these cells either by X-ray irradiation or with chemical carcinogens invariably results in the loss of the thyroid hormone control mechanism. The biological significance of these findings is under active study.

They have succeeded in obtaining purifications to 60% homogeneity with high yields by sequential DNA-cellulose chromatography. Efforts are now underway to scale up the procedure and to exploit the Milstein Hybridoma system in further purification by antibody affinity chromatography.

Dr. Dean Engelhardt and colleagues have continued work in regulatory mechanisms operating in cultured animal cells, and they completed a study of the control of protein synthesis that occurs when cells grow into the stationary phase of the growth curve. One of the conclusions of this study was the elucidation of a major translational control mechanism whereby mRNA is differentially recruited from the ribonucleoprotein fraction into the polysome fraction at a rate characteristic for each specific mRNA species.

In Dr. Philip Feigelson's laboratory, it has been shown that α 2u globulin, a protein synthesized in rat liver, ceases being synthesized in transplantable hepatomas. Utilizing heterogeneous translational systems and hybridization with a specific α 2u globulin cDNA probe have also demonstrated that these hepatomas are devoid of α 2u globulin mRNA sequences but do contain the α 2u globulin gene. Furthermore, during very early stages of chemical hepatocarcinogenesis, the α 2u globulin mRNA is deleted from the preneoplastic cells. Thus the α 2u globulin gene is present but is apparently not transcribed following neoplastic transformation.

Dr. Gabriel C. Godman and his colleagues have conducted investigations on 1) extrinsic regulation of cell growth, 2) the membrane-associated contractile-cytoskeletal apparatus of non-transformed and cancer cells, 3) lethal cell injury by DNA-binding carcinocides. A globulin of normal sera that selectively inhibits proliferation or mitogenesis of certain cell types, (including hepatoblasts, lymphoblasts and lymphocytes and colon-cancer cells) has been partly purified with a 200-fold gain of biological activity.

Dr. Barbara W. Low has begun a study involving analysis of bile from both normal and colon carcinoma patients to determine the possible significance of bile acids and of bile acid degradation products. Dr. Low is also studying the crystal structures of some bile acid degradation products and of the

complexes of bile acids with carcinogens.

The nuclear processing and gene structure of immunoglobulin $\gamma 2b$ heavy chain mRNA is being investigated in mutant mouse myeloma cells by Dr. Christine Milcarek and the mRNA's from the mutants have been analyzed and have shown that some or all of the CH₁ domain has been deleted. The genomic DNA does not share these deletions. This implies that the internally deleted mRNA results through a defect in the hn RNA splicing from an only slightly altered DNA template.

Dr. Sherie Morrison continues primarily to direct research towards achieving a greater understanding of the genetics and biochemistry of immunoglobulin (Ig) production in mouse myeloma cell lines by the isolation and characterization of mutants altered in the production of Ig. Mutants aberrant in the ability to bind antigen have been isolated; these mutants have been found to be abnormally glycosylated.

Radiation Biophysics

Drs. Harald H. Rossi and his colleagues have further developed the Theory of Dual Radiation Action, using data from recent radiobiological experiments with associated charged particles. Dr. Eric J. Hall performed experiments with a variety of electron affinic radiosensitizers and commonly used chemotherapy agents, to study their interaction with ionizing radiations.

Dr. Carmia Borek has successfully demonstrated the induction by x-rays of neoplastic transformations in human cells cultured *in vitro*, and continued a study of the effect of promoters and inhibitors on the incidence of transformation. Dr. Charles Geard studied the production of sister-chromatid exchanges and chromosome aberrations in mammalian cells treated with x-rays, chemotherapy agents and electron affinic radiosensitizers. Dr. Richard Miller carried out experiments with an established cell line to score the frequency of oncogenic transformations produced by x-rays and found that dose fraction led to an enhanced response at low dose levels.

Honors and Activities

Dr. Rose Ruth Ellison was named the American Cancer Society Enid A. Haupt Professor of Clinical Oncology. She continues as a member of the Board of Scientific Counselors of the Division of Cancer Treatment, National Cancer Institute.

Dr. Sherman was named a Junior Faculty Clinical Fellow of the American Cancer Society. He was named Knight Grand Commander of the Liberian Humane Order of African Redemption.

Dr. Weinstein was appointed to the National

Committee on Cancer Prevention and Detection of the American Cancer Society, the Mott Prize Committee of the General Motors Cancer Research Foundations and the Board of Scientific Counselors of the Division of Cancer Cause and Prevention of the National Cancer Institute.

Dr. Isidore S. Edelman was elected to the Council of the Endocrine Society.

Dr. Borek was elected a fellow of the New York Academy of Science.

Dr. Paul Marks was appointed by President Carter as Member, Commission on the Accident at Three Mile Island. He continued to serve as Editor-in-Chief of *Blood*. Dr. Marks was appointed Member, Visiting Scientific Committee, Yale University Cancer Center and as Member, Preparatory Committee of the Capital Medical Center, Peking, Peoples' Republic of China.

Dr. Hall is a member of the U.S.-Japan Cooperative Cancer Research Program and Chairman of the Radiobiology Committee of the Radiation Therapy Oncology Group.

Dr. Rossi is a member of the Main Commission of the International Commission for Radiological Units (ICRU); the Main Council, National Council on Radiation Protection and Measurements (NCRP) and the Committee on the Biological Effects of Ionizing Radiations (BEIR) of the National Academy of Sciences.

Dr. Miller was an invited participant in the Fifth International Workshop on Human Gene Mapping, Edinburgh, Scotland, and continues to serve on the Basic Sciences Committee of the National Foundation-March of Dimes.

Dr. Reba Goodman delivered two invited lectures in China.

Dr. Osserman was awarded the title Knight Grand Commander of the Humane Order of African Redemption by the Republic of Liberia. He serves on the Scientific Advisory Boards of the Institute for Cancer Research, Fox Chase, Philadelphia, and the Oklahoma Medical Research Foundation.

Dr. Erlanger was Scholar at the Pasteur Institute, Paris.

Dr. Kabat received the R.E. Dyer Lecture Award from the National Institutes of Health.

Dr. Chess was recently appointed to the medical advisory board of the SLE Foundation and associate editor of *Thymus*.

Dr. Bloom was invited to serve on the Staff of the President's Commission on the Accident at Three Mile Island. He participated in an International Course on Detection of Environmental Chemical Mutagens, in Concepcion, Chile.

Dr. Cecilia Fenoglio was appointed to the Edito-

rial Boards of: *Ultrastructural Pathology*, *The American Journal of Diagnostic Gynecology and Obstetrics*, and *Investigative & Cell Pathology*.

Dr. Spiegelman was elected to the Board of Trustees, Sackler School of Medicine, New York, and gave ten lectures by special invitation of the Chinese Academy of Science and the Chinese Academy of Medical Science. He was awarded a Ph.D. *Honoris causa* by the Weizmann Institute of Science, Rehovot, Israel.

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Gertrude H. Sergievsky Center

MERVYN W. SUSSEY

Sergievsky Professor and Director

The Gertrude H. Sergievsky Center, in its second full year, has moved into the stage of active program development. The core scientific faculty had been recruited and was in position by the end of the first year. Consequently, that research in the epidemiology of epilepsy, cerebral palsy and developmental brain disorders for which the Center was chartered could begin to be implemented.

Much of this activity was focused around a single concentrated effort, a response to a request for a proposal from the National Institute of Neurological and Communicative Disorders and Stroke (NINCDS) to establish a Comprehensive Epilepsy Program in New York City. This undertaking, directed by Dr. Allen Hauser, engaged the entire faculty of the Center for a period of months. The aim was to create a coordinated program of epilepsy research and care in North-West Manhattan and the Bronx. The leading medical centers of the designated region were enlisted. Thus, all the affiliated hospitals of Columbia University (Presbyterian, Harlem, Roosevelt-St. Luke's) and of the Albert Einstein College of Medicine (the Albert Einstein Medical Complex and Montefiore Hospital and Medical Center) joined in the proposed program. Relevant New York State and New York City agencies, voluntary agencies for epilepsy and for rehabilitation, local community councils, and representatives of minority groups also took part.

The proposal deals with the population of a defined region, thus realizing one objective of the Center, which is to generate interdisciplinary epilepsy re-

search with an epidemiological thrust. Besides the Sergievsky Center, the Departments of Neurology on each campus participated. In addition, at Columbia, the School of Public Health and the Center for Community Health Systems joined in the effort, and at Albert Einstein Medical College the Department of Community Medicine, the Rose F. Kennedy Center, and the Department of Social Medicine of Montefiore Hospital did so. Under the umbrella of the Comprehensive Epilepsy Program, no fewer than 28 research proposals have been prepared. Nine of these were written by Center Faculty themselves, who also joined with or consulted on a great many others.

Whether or not all or part of this proposed comprehensive program is funded, the task of preparing it has given impetus to epilepsy research at Columbia University and in New York City. The Center itself has been made visible, and it has demonstrated its potential strength. Faculty also made a showing at two meetings in particular. At the 8th Annual Symposium of the New York State Birth Defects Institute on Human Reproductive Loss held in Albany in October, Sergievsky scientists gave five invited papers. At the triennial meeting of the International Association for the Scientific Study of Mental Deficiency, held in Jerusalem, there were four papers by Sergievsky faculty.

For the future, a training program in neuroepidemiology proposed by the Center (through the Division of Epidemiology) has been favorably reviewed. It can be hoped the program will be funded and in operation during the course of the coming year.

Teaching

Drs. Stein, Belmont, Paneth, Neugebauer, Shafer, Shrout, Levin and Warburton taught courses at the School of Public Health. The epidemiology course for first year medical students at the College of P and S called on Drs. Stein, Susser, Hauser, Paneth and Shafer to lecture or lead sections. Drs. Susser, Stein, Shrout, Belmont, Kline, Shafer and Paneth served on epidemiology doctoral committees. Dr. Susser heads the Ph. D. (Epidemiology) Subcommittee, on which Drs. Stein and Warburton also serve. Clinical and EEG teaching was a prime concern of Drs. Goldensohn and Hauser. Sergievsky faculty conducted many other classes and supervised numbers of graduate students within the university. Drs. Oppenheimer and Neugebauer were preceptors for 10 trainees from the Health Research Training Program of the New York City Department of Health.

Research

Drs. Jennie Kline, Zena Stein, Barbara Strobino, Mervyn Susser and Dorothy Warburton have been newly funded by the National Institute of Child Health and Human Development and by the National Institute of Drug Abuse and Alcoholism to continue research on the epidemiology of spontaneous abortion and fetal defects. They will examine further the association of smoking with the spontaneous abortion of chromosomally normal conceptions and the association of maternal alcohol consumption with spontaneous abortion. Several additional factors, including oral contraceptive use and exposure to household products will be examined. One use of studies of spontaneous abortion is to search for factors associated with the genesis of cytogenetic abnormalities. Thus far, one new association has emerged—monosomy X with young maternal age. An initial intent of studying spontaneous abortions was to assess whether surveillance of these events could be used to monitor an environment for newly-introduced mutagens and teratogens. The feasibility of such a surveillance system is being evaluated in this study. Other members of this research team include Julie Byrne, Robert Cautin, Evelyn Kornhauser and Allen Mark.

Dr. Allen Hauser (Associate Director) pursued the analysis and write-up of work on prognosis after single seizures and on sibships in which more than one individual has had a seizure. In the prospective single-seizure study, Dr. Hauser and his colleagues (Drs. Annegers and Elveback) have established that the factor which best predicts a recurrence is having a sibling with a seizure history.

Dr. Holger Hansen continued his research on pre-

natal effects of phenylketonuria, on evaluation of programs to screen newborns, and on evaluating the New York City amniocentesis program.

Dr. Bruce Levin developed an interactive computer program for analyzing general multiple linear logistic regression problems. He is working out cumulative summation methods for spontaneous abortion monitoring.

A study directed by Dr. Nigel Paneth and supported by the National Institute of Child Health and Human Development (NICHD) is measuring the combined impact of New York City's infant transport network and neonatal intensive care procedures on neonatal mortality. Mr. John Kiely, a doctoral student in Epidemiology, and Dr. Mervyn Susser collaborate with Dr. Paneth on this work, which evaluates the effect of new medical technology on the community as well as the individual.

That the age of a mother at the birth of her child influences her child's measured intelligence in a regular fashion was a striking finding in Dr. Lillian Belmont's research on children of adolescent mothers; the older the mother, the higher is the child's mental performance. Drs. Belmont and Stein (together with Drs. Patricia Cohen and Joy Dryfoos) conducted this study under a contract from NICHD to the Alan Guttmacher Institute. Susan Zayac assisted with data processing. Some of their findings will appear in *Teenage Parents and their Offspring* (Grune and Stratton, in press). Dr. Belmont presented results at the NICHD's Workshop on the Effects of Adolescent Childbearing in Bethesda.

To identify fruitful areas of cost-effective research into cerebral palsy prevention, Dr. Hauser, with the help of Drs. Paneth, Chadwick and John Kiely, is preparing a report under contract from NINCDS. This document will help investigators to choose from among several research strategies, particularly to spot situations where complete case ascertainment may be achievable through an existing system.

Drs. Richard Neugebauer, Gerald Oppenheimer and Mervyn Susser expanded their survey of emergency services for seizure patients, while Drs. Stephen Shafer and Hauser did a smaller survey of neurology clinic use by such persons. Drs. Neugebauer, Oppenheimer and Susser are also doing a study of Fits in Public Places, an analysis of the frequency of police assistance to seizure patients in New York. These reports are basic groundwork for understanding the distribution of seizures in the community and for the improvement of services needed by persons with seizures.

For a study of triggering mechanisms in seizures, Drs. Neugebauer and Hauser have begun recruiting patients to keep life event diaries. Dr. Neugebauer

has written an invited review on the reliability of life event checklists. Dr. Neugebauer's investigation into theories about and treatment of mental disorders reveals that disposition of cases of bizarre behavior in 17th century England was more enlightened than medical historians have thought. Belief in psychological, rather than demonological, factors underlay the attitudes of civil authorities.

Dr. Oliver Chadwick has been preparing for publication the results of a three year prospective cohort study of the cognitive and behavioral sequelae of severe head injury in children. He also continued analysis of the findings from a separate study, carried out in conjunction with Dr. David Shaffer (Psychiatric Institute), of residual psychological outcome after localized head injury in childhood.

Dr. Patrick Shrout worked with Drs. Bruce and Barbara Dohrenwend (Social Psychiatry and Socio-medical Sciences) on measures in psychiatric epidemiology. He also consulted on the analysis of the spontaneous abortion study.

Dr. Eli Goldensohn, with Alfred Salazar and Leonard Zablow, continues research on the cellular mechanisms of experimental penicillin epileptogenesis.

Dr. Stephen Shafer developed the follow-up neurometric examination for a comprehensive neuropsychiatric assessment of adolescents which aims to measure the significance of nonlocalizable neurological signs noted ten years ago. This retrospective cohort study is directed by Dr. David Shaffer (Child Psychiatry, Psychiatric Institute). Dr. Shafer also worked with Drs. L. P. Rowland and Marcelo Olarte (Neurology) on their trial of levamisole in amyotrophic lateral sclerosis.

Dr. Ida Susser, with Dr. Hauser consulting, will direct a project funded by the Epilepsy Foundation of America, an anthropological cross-cultural study, of attitudes toward epilepsy and health services for epilepsy. The field area is on the upper west side of Manhattan. James Trostle collaborated in planning this study.

Honors, Services, and Activities

Dr. Lillian Belmont served as a reviewer for *Social Biology* and for *Perceptual and Motor Skills*.

Dr. Oliver Chadwick's work with Professor Rutter and Dr. Shaffer was presented at the Carrier Foundation Meeting, in "Hyperactivity and Minimal Brain Dysfunction: Epidemiological Perspectives on Questions of Cause and Classification."

Dr. Eli Goldensohn was appointed to the National Task Force for the Implementation of the Recommendations of the National Commission on

Epilepsy. He was the guest speaker at the Iberian American Neurological Congress in Lima. Dr. Goldensohn gave several invited lectures, including the Fourth Annual Charles D. Roberts Symposium on Epilepsy at the Philadelphia Neurological Society. He directed the Annual Course in Clinical Electroencephalography at the American Academy of Neurology and continued as a member of the Board of Directors of the American Board of Qualification in Electroencephalography. He is Vice President of the Epilepsy Foundation of America. Dr. Goldensohn was made a consultant to the New York State Commission for Quality Care for the Mentally Disabled.

Dr. Holger Hansen was Acting Head of the Division of Epidemiology through June. He read a paper in Jerusalem at the meeting of the International Society for the Scientific Study of Mental Deficiency.

Dr. Allen Hauser (Associate Director) served on the Consensus Meeting Planning Committee for Febrile Seizures of the National Institute of Neurological and Communicative Disorders and Stroke. He is consultant to the Comprehensive Epilepsy Program for the State of Minnesota. The Neuroepidemiology Section of the American Academy of Neurology elected him Secretary in 1979, and he continues to be Secretary-Treasurer of the Central Association of Electroencephalographers. Dr. Hauser gave invited presentation before the American Academy of Neurology, Montefiore Hospital, and at the 70th Anniversary of the Neurological Institute.

Dr. Jennie Kline was a consultant to Los Alamos Scientific Laboratory and to the U.S. Environmental Protection Agency. She presented an invited paper at the New York State Symposium on Human Reproductive Loss. At the Annual Meeting of the American Public Health Association, Drs. Kline and Strobino presented results from the spontaneous abortion study.

The Epilepsy Foundation of America honored Dr. Richard Masland with its Pearce Bailey Award. Dr. Masland is on the advisory boards of the National Genetics Foundation, United Cerebral Palsy, National Multiple Sclerosis, Myasthenia Gravis Foundation, The Samuel Orton Society and the Epilepsy Foundation.

Dr. Neugebauer was invited to discuss "Stress and Psychiatric Disorders: Research Findings and Problems" at the Department of Psychiatry, Montefiore Medical Center. He attended the 11th Epilepsy International Symposium in Florence.

The Task Force on Predictors of Fetal Distress of NICHD included Dr. Nigel Paneth, who was a co-author of the report. Dr. Paneth also was an invited

participant at an NICHD workshop on clinical trials of electronic fetal monitoring and a National Heart Lung and Blood Institute workshop on pulmonary and neurologic follow-up of infants. He was a panelist at the 5th Congress of the International Association for the Scientific Study of Mental Deficiency in Jerusalem and delivered a paper on neonatal mortality rates at the Annual Meeting of the American Public Health Association.

Dr. Stephen Shafer was a consultant to the Department of Neurosurgery, Albert Einstein College of Medicine, on their study of head trauma. He was a consulting editor of *Environment* and a reviewer for *Neurology*.

Dr. Zena Stein was awarded a Josiah Macy Faculty Scholarship for her sabbatical term in 1979. This award took her to London for the second half of the year. There she worked with Dr. Paul Polani (Guys Hospital Pediatric Research Unit) and Dr. Eva Alberman (the London Hospital). She was a consultant to the Environmental Protection Agency on the risks to reproductive health posed by persistent pesticides. Dr. Stein presented papers on maternal nutrition at the Pan American Conference, Panajachel, Guatemala, the International Association for the Scientific Study of Mental Deficiency in Jerusalem and St. Thomas Hospital Medical School, London. She discussed aspects of her work on the epidemiology of spontaneous abortion before the Hunt Valley Industrial Workshop in Galveston; the conference for the American Association for Mental Deficiency; the Society for Epidemiologic Research; the Symposium on Human Reproductive Loss, Albany; and Middlesex Hospital Medical School. In October she was Visiting Lecturer in Epidemiology at the University of Maastricht, and also read a paper on Epidemiology in Child Psychiatry at the meetings of the American Academy of Child Psychiatry. Dr. Stein was on the editorial boards of *Biological Psychiatry*, the *Journal of Applied Research in Mental Retardation*, and the *Journal for Research Into Down's Syndrome*. She served on the Epidemiology Review Committee of NIMH the S.I.D.S. Advisory Committee; Committee on Health and Society, Barnard College; and the Steering Committee of the New York amniocentesis program.

Dr. Barbara Strobino read an invited paper on

Recurrent Spontaneous Abortion: Definition of a Syndrome, at the 8th Annual New York State Birth Defects Institute Symposium on Human Reproductive Loss.

Dr. Mervyn Susser (Director) was on sabbatical leave in the autumn term. He worked with Dr. A.M. Adelstein, Chief Statistical Medical Officer at the Office of Population Censuses and Surveys, United Kingdom. He gave a "state of the art" paper on effects of maternal nutrition on fetal outcome at a United States Department of Agriculture/NICHD workshop, also lecturing on this subject at the University of Maastricht, at the 8th Annual New York State Symposium on Human Reproductive Loss and at St. Thomas Medical School. He was a consultant to the Pan American Health Organization and Visiting Professor at the University of Rio de Janeiro, Institute of Social Medicine. Dr. Susser also presented before the New York Academy of Medicine, the National Academy of Sciences Committee on Aging, Department of Social Medicine, Hebrew University, Jerusalem, University of Brasilia Medical Faculty, Department of Sociology, Bedford College (University of London), and the Department of Biology of the Middlesex Hospital Medical School. Dr. Susser chaired the New York Heart Association Council on Public Education, and continued to serve on the New York Academy of Medicine Committee on Epidemiology and Community Psychiatry. He was guest editor of an issue of the *International Journal of Mental Health* on "Epidemiology of Behavioral Disorders in Children," and continued on the editorial boards of the *International Journal of Health Services* and of *Early Human Development*.

Dr. Dorothy Warburton presented "Chromosome abnormalities in spontaneous abortion" at the 8th Annual New York State Symposium on Human Reproductive Loss. She also presented at the 30th Annual Meeting of the American Society of Human Genetics, and the Southampton meeting of the European Society of Human Genetics.

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Reports of Women's Auxiliaries
The Presbyterian Hospital in the City of New York

Board of Women Managers of the Babies Hospital

MRS. MELVIN L. BEDRICK, *President*

With the ever changing needs of The Presbyterian Hospital, three shell floors (6, 7 and 8) in the Babies Hospital have been designated to house the Sloane Hospital for Women. The labor and delivery suites will be located on 12 South, ultimately establishing the first comprehensive center for maternal and child care in the city.

Congratulations to Miss Jane McConville who, in November, became Associate Director of Nursing for the Sloan Hospital for Women. She will continue as Associate Director of our hospital. However, her duties will focus on long-term planning and coordination. All daily operations at Babies will be under the skillful supervision of Miss Janet Alley, Assistant Director of Nursing.

Once again this year our major source of income was The Greater New York Fund. With particular thanks to Mrs. Carll Tucker, Jr., who chaired the United Hospital Fund campaign which brought us a direct benefit of \$8,722 and a Free Care Distribution of \$1,186. We received 13% of the total monies earned by Presbyterian Hospital. This percentage is determined by a new formula of a five-year average of monies raised.

Our third lecture series realized \$6,385. Our share of the Joint Auxiliaries Theater Benefit was \$5,425 for our Board. We received \$500 from the Society for the Relief of Women and Children. Metropolitan Life Insurance Company, Miss Hewitt's Classes and U.S. Aviation Underwriters provided Christmas toys and dolls for all the children in our hospital.

Our Board acknowledges the gifts of Mr. and Mrs. William E. Hill and Mrs. John S. Tilney.

Through a gift from Mr. and Mrs. DeWitt Hornor, which was matched by our Board, we established the Hornor Pediatric Clinic Recreational Therapy Fund. This fund will greatly aid Toby Miroff, our valued clinical therapist. Mrs. Joseph V. McMullan's generous gift has made possible the discretionary fund for the Pediatric Clinic. At the request of the Clinic, and discretion of our Board, these monies will be used to support programs and projects.

We continue to support a partial social service salary of \$9,057.24, and a full-time recreational therapist salary of \$14,443.36. We donated \$500 to the Volunteer Department. Our annual contribution to the Pediatric Psychiatric Clinic was \$1,500. The Board will continue to work closely with the Administration and the Comptroller's Office in its endeavor to raise monies for Babies and properly distribute them to the areas of greatest need. A special thanks to Mr. M. James Peters, Mr. Philip Reville, Mr. Eugene Daly, and Mrs. Keith Moffat, our treasurer, who have competently managed our accounts and statements.

Recreational Therapy has been very active, with 21,944 patient contacts this year. The school census was 3,286.

We welcome Barbara Betancourt as a full-time therapist, and thank Loretta Crawford for her help while Mary Harrison was on school leave.

We acknowledge Diedri Phillips for adding new dimensions to the department. The Play Hospital videotape equipment and Puppet Play Therapy have been valuable teaching tools for the children and their hospital experience.

Mrs. Dorothy Diamond again generously provided 165 volunteers for our hospital, 137 adults and 28 "Candy Strippers", who together represent 16,971 total volunteer hours.

It is with regret that I report the death of Mrs. Thomas V. Santulli, who served on our Board for 22 years. Our new members in 1979, were Mrs. Timothy Healy and Mrs. Charles M. Pratt. Mrs. John W. Spurdle, Jr. has moved to associate member, as has our beloved Miss Hope Kingsley. We acknowledge the resignation of Mrs. Beirne Rose and Mrs. Iredell W. Iglehart.

Mrs. Neville J. Booker, a committed member of our Board for 47 years, resigned this year. We wish to thank her for her continuing interest in and support of the activities at Babies.

In November, the United Hospital Fund honored six distinguished members of our Board for 40 years of service to the Fund. With great pride, we congratulate Mrs. Leo C. Fennelly, Miss Hope Kingsley, Mrs. James McCosh Magie, Mrs. Joseph V. McMullan, Mrs. Grover O'Neill, Sr., and Mrs. Henry C. Taylor, and thank each of them for the contribution they have made to our Hospital.

Mrs. B. Rionda Braga chaired an exciting and successful Third Annual Lecture Series this year. Our Speakers were C. Andrew L. Bassett, M.D., Anthony Donn, M.D., and Gabriel G. Nahas, M.D., each an outstanding member of The Presbyterian Hospital staff. Next year's series will be co-chaired by Mrs. Adlai S. Hardin, Jr. and Mrs. Charles Pratt.

Mrs. Bayard W. Walker has agreed to chair our theater benefit in February 1980.

Mrs. Lansing Lamont will serve as Liaison from our Board for planning of the Presbyterian Hospital Shop, Office for the Auxiliaries, and other joint projects.

The Board thanks Mmes. Tilney, Collins and Hill, who work closely with the Departments of Nursing, Recreational Therapy and Social Service.

1979 brought many Speakers to our meetings. We wish to thank Hector Bird, M.D., Nicholas Cunningham, M.D., Mr. Eugene Daly, Felix E. Demartini, M.D., Miss Agnes Dilworth, Mr. David Ginsberg, Michael Katz, M.D., Miss Jane McCon-

ville, Miss Diedri Phillips, and John Roglieri, M.D.

We have continued a close association with Drs. Cunningham and Bird in the clinic. We are concerned that the new pediatric clinic have the space, furnishings, and equipment to meet the needs of all its patients. The adolescent program under the direction of Karen Hein, M.D., will commence after January 1, 1980. Dr. Arthur Green's child abuse program is in operation. Dr. Cunningham will supplement this program with a Day Care program and a crisis nursery which will have eight beds for children "at risk" for abuse and/or neglect. Twenty-four hour admission is available for referrals in the Borough of Manhattan.

Our Board has worked closely with the other Auxiliaries on a number of projects: The planning of the Presbyterian Hospital Shop, an office for the Auxiliaries, Joint Theater Benefit, Dr. Roglieri's Vanderbilt Clinic project, the Presbyterian Hospital Art Show, and the replanting of the Hospital's garden.

After careful consideration of a merger of the Auxiliaries on a number of projects: the planning of its traditional status for the immediate future. We look forward to a continuing cooperation with the other Auxiliaries and we will reconsider an amalgamation at an appropriate future date. I am grateful to Mrs. Equinn W. Munnell, Mrs. Thomas Devine and Mrs. S. Lytton Scott, for sharing the minutes of their monthly meetings and working with me on projects which are important to the entire Hospital community. Our common goal is to unify the non-professional services available to all patients.

I especially want to thank Dr. Katz, Dr. Demartini, Dr. Charles T. Ryder and Mr. Ginsberg, all of whom have been available to the needs of our Board. It has been a privilege to have their counsel and continuing interest. I am grateful to Mrs. Kathleen Thompson for her secretarial support and gracious sharing of her office.

We are fortunate to go forward with the able leadership of my successor, Mrs. Peter Millard. With the coming of a new decade, our Board renews its commitment to support The Presbyterian Hospital to insure the excellent standard of patient care which has long been a tradition of this institution.

Cribside Social Service Committee

MRS. WILLIAM E. HILL, *Chairman*

The Cribside Social Service Committee of the Board of Women Managers of Babies Hospital continued its interest in the Social Service needs of our young patients during 1979.

We sent 70 handicapped children to specialized camps. Endowed Beds continued to be approved for medically indigent children.

Through Mrs. Herbert W. Warden, III we received, as we have for many years, a substantial contribution from the Relief of Women and Children for the sociomedical needs of our children.

When Mrs. Thomas A. Buckner, Jr., formerly a member of the Cribside Committee, died in the summer of 1979, she had kindly arranged for dona-

tions to go to Babies Hospital Social Service. We are most grateful for her thoughtfulness.

We also continue to be grateful to Mr. and Mrs. K. Herluf Trudso for their Christmas remembrance each year. Though Mrs. Trudso is no longer an active Cribside member, she still maintains an active interest in our work which we so appreciate.

To all members of Cribside, my sincere thanks for their keen interest in and their untiring efforts on behalf of the youngsters known to Social Service. I would also like to extend my thanks to Miss Agnes D. Dilworth, the Associate Director of Social Service and her entire staff of social workers for their devoted contribution to patient care.

Neurological Institute Auxiliary

MRS. S. LYTTON SCOTT, *Chairman*

The Neurological Institute Auxiliary continued during 1979 to develop and help implement programs concerned with improving patient care throughout the Institute.

Mrs. Carl T. Chadsey and Mrs. Robert Follert have worked closely with Mr. Kevin Dahill who last year was appointed Director of the newly created office of Patient Relations Service.

Mrs. Donald Quest joined Mrs. Niels Low in over-seeing the Pediatric Neurological Clinic playroom. The salary of the Clinic's Recreational Therapist, Ms. Rena Matison, who is in charge of the playroom on Wednesday afternoons of each week, is paid by the Auxiliary which also donated Christmas presents and hosted a Christmas party for the children and their parents, at which Mrs. Richard Masland and Mrs. Edward B. Schlesinger joined Mrs. Quest and Mrs. Low as hostesses. At Dr. Low's request the Auxiliary has agreed to fund a Spanish-speaking interpreter for the Clinic on Wednesday afternoons.

The Therapeutic Recreation Program, which has been funded by the Auxiliary for three years on a part-time basis, was expanded to a full-time service in March 1979 under the direction of Ms. Andrea Fitzgerald, who is a registered Therapeutic Recreational Therapist with a B.S. degree from N.Y.U. This full-time service has been made possible by Dr. John A. Downey's contribution of additional funds from the Department of Rehabilitation Medicine; from Auxiliary member, Mrs. William W. Foshay; and increased contributions from Mr. Eldon B. Sullivan and from the Sasco Foundation and the continuing support of Mrs. S. Lytton Scott. The program is

now brought to patients throughout the Institute and the medical staff is recognizing the value of a Therapeutic Recreation Program by referring their patients in increasing numbers to Ms. Fitzgerald. In December a piano was contributed to the program by Dr. Darryl DeVivo and Mrs. Chadsey contributed the cost of transporting it to the Hospital.

Mrs. Hilary P. Reddy continued taking the shopping cart with the help of Mrs. W. Jost Michelsen, to patient floors one afternoon a week for the benefit of staff and visitors as well as the patients.

The offering of an award of \$100 contributed by the Auxiliary, with a citation for outstanding performance on the job to four ancillary help employees, was repeated this past April with Mr. Edward H. Noroian presenting the awards to Mr. Emmanuel Peralta and Mr. Charles Dechamps, x-ray technicians; Ms. Carrie Evans, nurses' aid, and Mr. Silas Williams, housekeeper, at a ceremony followed by tea hosted by the Auxiliary members and attended by a representative group of doctors and staff of the Institute. It is planned to continue to offer these awards each year as an incentive to employees and as a way of encouraging good morale.

The Auxiliary heard two speakers during the past year. Dr. Laura Merker, Associate Director of Nursing, spoke to us in May about the acute problems in recruiting and keeping nurses citing the old-fashioned plant, the dangerous neighborhood, lack of adequate parking facilities and morale problems that have developed here. Dr. John L. Antunes spoke at the November meeting on the Role of the Brain and Pituitary Gland in Reproduction.

Under the continued direction of Mrs. Royall G. Cannaday, who has agreed to remain chairman of the Thrift Shop until an able replacement can be found, the Shop has had a successful year. From a total of \$29,758.35 in sales \$20,395.25 was distributed to the Auxiliary which represents a substantial increase over 1978. Assisting Mrs. Cannaday were Mrs. Low, Mrs. Gordon McAlpin Pyle, Mrs. H. Houston Merritt, Mrs. Schlesinger and Mrs. Charles Stroud.

We continued our practice of giving a luncheon at the Faculty Club after the May meeting for members of the nursing service and after the December meeting for the Social Service Department which gave its annual presentation at this meeting.

Mrs. John H. Stookey headed the United Hospital Drive which resulted in \$23,489 raised from a total of 129 gifts and through Mrs. John Weinberg's leadership our Box Week total was \$440. The Auxiliary received from the United Hospital Fund \$10,000 for the Neurological Institute Library. We also received \$2,092 for the Auxiliary's general funds under the title of free care distribution. Our contribution to the Greater New York Fund was \$1,800.

With Mrs. Charles Adams as almoner, we received \$500 from the Havens Relief Fund, the Society for the Relief of Women and Children again contributed \$500 to the Auxiliary and the Sasco Foundation increased their gift to \$2,500 earmarking it for the Therapeutic Recreation Program.

Other Auxiliary projects were the Milbank Library to which we donated \$8,000; the Volunteer Service which we gave \$1,900 and the salary of the nurse specialist in the Neurological Clinic, Ms. Michele Madonna, toward which we contributed \$5,000. Ms. Madonna helps over 250 clinic patients and supervises the aftercare of those who need help after they leave the Hospital.

Our contribution to Social Service activities for patient care needs (transportation, home equipment, homemaker costs and maintenance) was \$807.

Four new members have been added to our membership: Mrs. Dean Davies, Mrs. John A. Downey, Mrs. Robert Follert and Mrs. Donald Quest and the Auxiliary regrets the resignation of Mrs. John E. Scarff. The Auxiliary notes with deep regret the death of Mrs. Charles Munson.

We have continued to work with the other Auxiliaries on various projects. The Art Show was rein-

stituted last year and was put on again in September. Members of CPMC were invited to exhibit their work. The four Auxiliaries contributed \$150 each toward the expenses of putting on the exhibit. As it has been each year the show was received with enthusiasm and was followed by a wine and cheese party hosted by the four Auxiliaries.

The four Auxiliaries also combined in organizing a Benefit which consisted of two operas given at the New York City Opera, "Dido and Aeneas" and "Le Bourgeois Gentilhomme" on April 13 preceded by a dinner at The Ginger Bread Man. Our Auxiliary realized a profit of \$5,425.07.

Another joint project of the Auxiliaries, Dr. John Roglieri's proposal to provide a "caring presence" at the Vanderbilt Clinic has been postponed until the completion of the renovation of Vanderbilt but it is hoped it can be resumed in the near future.

A major project on which the four Auxiliaries will join in contributing money and volunteers is the proposed Gift Shop in Presbyterian which will serve the entire Medical Center. As soon as the Hospital's plans for the over-all renovation are complete the architectural layout and the organization of the Gift Shop will be worked out by the four Auxiliaries.

The possibility that by merging the four Auxiliaries into one we might be able to better serve the Hospital as a whole was analyzed and discussed over several months from many angles. We have concluded that our contribution to the Neurological Institute is unique and might be seriously diluted by becoming part of a larger unit. The doctors and the staff at Neuro concurred so strongly with this view that we have made the decision to remain separate from the other Auxiliaries should they decide to merge. We hope, of course, to continue to work with them as we have in the past on many projects.

The Auxiliary was again represented on the Patient Care Committee, at the staff meetings of the Department of Neurological Surgery and at the monthly luncheon meetings for the Administration and the Auxiliaries. Our thanks to Dr. Daniel Sciarra, Dr. Edward B. Schlesinger and Dr. Felix E. Demartini for their courtesy in giving us these opportunities.

Our thanks also to Mrs. Kathleen Thompson in Public Interest for her skills, competence and endless patience assisting in the work of the Auxiliary.

Women's Auxiliary of the New York Orthopaedic Hospital

MRS. THOMAS J. DEVINE, *President*

The past year the members of the Auxiliary have followed with keen interest the proposed reconstruction plans for the adult Orthopaedic fifth floor and for the babies' unit on the eighth floor. Special thanks go to Mrs. E. Allen Dennison and Mrs. Willis L. M. Reese, who have been in constant touch with Dr. Alexander Garcia, Director of Orthopaedic Surgery, and Miss Rosemary Hoynak, Director of Orthopaedic Nursing.

1979 has also been a year of active cooperation with the Babies, Neurological, and Presbyterian Auxiliaries. A joint benefit was held on April 10th and 13th at Lincoln Center, and several meetings have been held to consider operation of a possible gift shop. Meetings have also been held to discuss the possibility of a merger.

Most of the Orthopaedic Auxiliary meetings have been held at the Hospital, where Miss Hoynak and Mrs. Lisa Jantzen, our recreational therapist, have kept us well-informed. The Orthopaedic Service continues to maintain one of the highest occupancy rates in the Medical Center.

The United Hospital Fund drive was again led by Mrs. Edward H. Gerry. As of March 1979, \$31,762

had been raised by 246 gifts. Also, Mrs. C. Suydam Cutting was honored by the Fund for 40 years of service.

As in the past, Auxiliary members contributed toys and games to children in the Hospital over Christmas.

Mrs. Christopher Michelsen was welcomed as a new member. With great regret the resignation of Mrs. Albert L. Key was accepted.

The budget for the year included support for the care of ward and clinic patients, salary and supplies for a recreational therapist, and partial salary for an assistant in the Milbank Library.

I want to thank both Mrs. Hugo A. Keim and Mrs. Robert E. Carroll, the past two presidents of the Auxiliary, for their help and counsel throughout the year. Their guidance has been invaluable. Mrs. George H. Tilghman has been an excellent treasurer, and the Auxiliary is especially indebted to Mrs. Dennison, who has done a marvelous job as secretary. The Auxiliary greatly appreciates the guidance and interest of the administration, and I wish to thank all the members for their continuing support of New York Orthopaedic Hospital.

Presbyterian Hospital Auxiliary

MRS. EQUINN W. MUNNELL, *President*

The year 1979 has been one of constant change throughout the Medical Center. The enthusiasm and optimism for the future expressed by the entire management team of the Hospital is contagious and has made our contribution to their larger effort both exciting and rewarding. The long awaited renovation of the first floor of Presbyterian Hospital has begun.

We are pleased to report the decision of the Hospital Administration to include in the Master Plan an allocation of space for a centrally located "Gift Shop," a service urgently needed and long requested by the Auxiliaries, the staff and patients alike. The Presbyterian Hospital Auxiliary, the Board of Women Managers of the Babies Hospital, the Neurological Institute Auxiliary and the Women's Auxiliary of the New York Orthopaedic Hospital have been asked to initiate this service as a joint project as soon as the necessary construction can be completed. The Presbyterian Hospital Auxiliary voted unanimously to support this project. The other three Auxiliaries have also indicated their interest and support. Space has now been assigned and plans have been presented for our consideration.

We had hoped to be operational by January 1980, but due to delay in construction no date for opening has been announced. Many problems remain to be solved but all have agreed that this service is of great importance to the entire Hospital community. This has been demonstrated by the continued success of the Shopping Cart. Mrs. Charles J. Campbell, our hard-working Chairman reports a modest profit again this year and increasing pleas for a Gift Shop.

During the discussions held by the Presidents of

the four Auxiliaries on the problem of volunteer recruitment for the Shop, the question was again raised as to the possible merger of the Auxiliaries into a single organization which would serve the entire Medical Center. The obvious advantages of such a move would be two-fold: elimination of duplicated services, both accounting and secretarial, and added influence and effectiveness that could be attained by a larger single group. At a time when many volunteers are turning to careers as paid professionals, service organizations such as ours are finding themselves limited in their ability to implement new programs by their inability to secure adequate numbers of volunteers. After several meetings devoted entirely to discussion of the pros and cons of such a move, the matter was referred back to the full membership of each Auxiliary for consideration. The Presbyterian Hospital Auxiliary voted to welcome this move when it became appropriate to do so. It was agreed that such an important step must be taken very slowly. Since our commitment has always been to a large number of departments, we have no fear of diversification. Understandably, the members of the other three Auxiliaries with their deep dedication to a single unit in the Medical Center are hesitant to take such a step for fear it would dilute their ability to secure maximum benefits for their own hospital group. It was further agreed that the Auxiliaries should continue their initial cooperative efforts on the Shop and should continue to participate on other joint ventures such as the 1979 Benefit held at the New York State Theater in April. The Benefit was not highly successful but it did net each Auxiliary \$5,425 and afforded us the

opportunity to work together. The Second Annual Art Show held at the Hospital in September under the direction of Mrs. Dorothy Diamond and the Personnel Department was a great success and we hope it will continue to be held on an annual basis. We also cooperated in a pilot program initiated by Dr. John L. Roglieri, jointly providing volunteers in the Vanderbilt Clinic to assist patients. Mrs. Alfred J. Lignon appeared faithfully until the program was temporarily abandoned until renovation is complete. We would hope that after continued cooperation on these and other projects, we might eventually achieve our goal of unity.

In view of the outlay of funds which may be required to establish the Shop, the Auxiliary elected to support only those programs already in existence. These are: 1) The Recreational Therapy Program, fully supported by the Auxiliary, which is under the direction of Mr. William McKee. Mrs. Alfred J. Lignon, Chairman, reports that some 2,500 patients were served this year by group projects, musical entertainment, gift making for the holidays, and various handcrafts. This work has been of great value in diverting and comforting those hospitalized for long periods. The maternity floor has been added as an area of service this year. 2) The Milbank Patient Library, under the direction of Mrs. Sherry Arfa, has expanded its stock of books to 10,414. We give \$10,050 annually to this excellent facility. Mrs. Arfa and Mrs. Joseph A. Silverman of our Auxiliary are working together on a Music Therapy Program. Mrs. John F. O'Brien and Mrs. Albert R. Perry, Jr., Chairmen, have reported that 15,882 books and periodicals have been circulated to 8,319 patients and 2,291 staff members. The Talking Book Program is active and magazines are distributed in the Clinics. We wish to thank Mrs. Lawrence Bogert, daughter of Margaret and Jeremiah Milbank, for her generous gift of \$1,000 again this year for the support of the Library. 3) Social Service: Mrs. Paul A. Marks, Chairman, reported a renewed need for funds in the Anna Ball Kneeland Fund for Social Service and we supplied this need with \$500. Mrs. Ralph H. Boots and Mrs. Samuel W. Lambert, Jr. as Almoners dispensed \$2,600 from the Havens Relief Fund Society. 4) The Auxiliary also gave \$1,000 to the Student Nurse's Scholarship Fund, \$500 to the Blood Bank Educational Fund, and \$500 to the Emily Webster Fund at the Medical Center Nursery School. 5) We supported the Volunteer Department with \$7,200. The director, Mrs. Dorothy Diamond, provided us with volunteers on many occasions for certain programs. She was grateful for our \$825 which paid for parking permits used by 22 volunteers. Mrs. George Perera, our ever faithful Chairman, reports that dur-

ing 1979, 758 volunteers served 109,511 hours—an increase of 8,328 hours over last year. The Volunteer Award Tea was well attended. Mrs. Robert J. Senkier, Vice Chairman presided and members of all the Auxiliaries helped pour tea. Mr. Edward H. Noroian, as guest speaker, thanked all the volunteers and asked them to publicize the deep concern The Presbyterian Hospital feels for the community it serves.

The Committee on Legislation continues to expand its activities. Mrs. Gilbert J. Vosburgh and Mrs. Cornelius J. Tyson, Jr. attended the Annual Meeting of the American Hospital Association in Washington in February. Dr. Felix E. Demartini joined them for a portion of the program and they were able to meet with Congressman Theodore S. Weiss and other members of the New York Congressional delegation. A direct result of this meeting was an invitation extended to Congressman Weiss by Mrs. Vosburgh to visit the Medical Center in May. This he did and was entertained at lunch with members of the Administration, the staff, community leaders and representatives of the four Auxiliaries. As was the case after the visit to the Hospital of State Senator Franz S. Leichter, this personal contact has been the basis for the establishment of a good working relationship between the Hospital and these legislators. Mrs. Joseph K. Slap, Mrs. Vosburgh and I went again to Albany with a group from the Committee on Legislation of the Division of Voluntary Programs of the United Hospital Fund. We were greeted as old friends by Senator Leichter and we also made personal contact with Assemblyman Herman D. Farrell, Jr. Since then all of these legislators have visited the Hospital and have talked at length with the Administration on problems in the community. We are pleased by the success of this effort in establishing a line of communication between our lawmakers and the Hospital. We also realize that initial success in this area came because our members took information to Washington and to Albany about the active programs in progress at the Medical Center which address many urgent community problems. The obvious interest of the Hospital in high-quality primary health care as well as community development impressed both Senator Leichter and Congressman Weiss. At a time of enormous change in the entire health care field we are indeed fortunate to have a forward-looking administration. We appreciate the recognition given us by the Administration and are happy with the trust placed in us as representatives of the Hospital.

Our main source of income is still the Stuyvesant Square Thrift Shop, Inc. of which we are a member. In 1979 Mrs. Carl R. Feind and her hard-working

group of volunteers worked long hours, sorting, pricing and selling in order to raise \$31,019.91. We are deeply indebted to them and to our loyal donors without whom we could not exist. Special thanks go to Mrs. Ralph H. Boots who spends untold hours sending out receipts in addition to all her other activities in the Shop. I have continued as President of the Board of the Stuyvesant Square Thrift Shop but will retire from that post in January 1980.

We take an active part in the letter writing campaign of the United Hospital Fund. Under the leadership of Mrs. George D. Barson 50 workers secured 339 gifts and raised a total of \$33,616 during the 1978 drive which ended in March 1979. We received \$25,608.76 from the Greater New York Fund and \$2,954.09 from the Free Care Distribution of the United Hospital Fund. Our Direct Benefit to be used for the care of ward and clinic patients totaled \$12,276. This large increase in our receipts from both the Greater New York Fund and the United Hospital Fund reflects the new formula for internal distribution of these monies which became effective in 1978. We are grateful to Mrs. Vosburgh for her vigilance in our behalf. This change was initiated after a review of the old formula, based on earnings in 1951, had been requested. The new criterion is now based on a five-year rolling average of campaign results which has obviously produced a distribution more fairly representative of each Auxiliary's earnings. Special mention must be made again of the work of Mrs. Ralph H. Boots who wrote some 200 letters and secured 120 gifts. Mrs. Boots and Mrs. David H. McAlpin were specially honored by the United Hospital Fund at a luncheon this fall as members who have worked in the Manhattan-Bronx division for 40 years or more. The 1979 campaign is well on its way and we wish to thank all our members who have taken part in this important work.

Many of our members have taken advantage of the programs offered by the Division of Voluntary Programs of the United Hospital Fund. Mrs. Vosburgh is Chairman of the Subcommittee on Distribution and a member of the Women's Executive Committee; Mrs. Senkier is a member of the Committee on Issues in Voluntarism, and I am a member of the Auxiliary Presidents Council and continue my work with the Committee on Legislation.

We have been privileged to hear interesting speakers on a variety of subjects at our monthly meetings. Mrs. Joyce Black of the Mayor's Action Committee discussed the future of Voluntarism. Elizabeth Graham outlined plans for the vocational guidance component of the Young Parents Program—funding for which was secured with the help of Mrs. Vosburgh and Mrs. Maxwell Abramson

from a grant from the United Hospital Fund. We particularly enjoyed a fascinating slide-lecture presented by Dr. Charles J. Campbell, Chairman of the Department of Ophthalmology, on the dramatic advances in the care and treatment of the eye. Mr. Gerald Jacobson, Acting Assistant Director Health Systems Agency, Borough of Manhattan explained the role of this agency and its importance in future planning at the Medical Center. In November, we were offered an opportunity to find out "Why Are Hospital Costs So High?"—a look at the hidden costs of our over-regulated health care system presented by members of the Committee on Legislation of the Division of Voluntary Programs of the United Hospital Fund.

At our Annual Meeting in May, the Nominating Committee under the chairmanship of Mrs. Richard B. Duane, Jr. presented the following slate: President, Mrs. Equinn W. Munnell; First Vice President, Mrs. Alfred J. Lignon; Second Vice President, Mrs. Bruce D. Williams; Treasurer, Mrs. Joseph K. Slap. These officers were then elected. Mrs. Slap as Membership Chairman reported the following changes in membership for the year. New members: Mrs. Bruce Bambrough and Mrs. Sawnie R. Gaston. We would like to welcome these new members. Mrs. Frank E. Gump changed from Active to Associate membership; we are pleased that Mrs. Gump will stay with us as an Associate member. Mrs. Hugh Williamson, Mrs. Everett C. Bragg and Mrs. Dana T. Bartholomew resigned. We are sorry to accept the resignations but would like to thank those outgoing members for their past services. The death of Mrs. George H. Wilkie, a long time member of the Auxiliary, was noted with sadness. We now have 56 active and 40 associate members.

Since my term of office began in May, credits for many of the accomplishments of the Auxiliary in 1979 must go to Mrs. Gilbert J. Vosburgh, whose inspired leadership significantly expanded the horizons of the Auxiliary. I wish to express to her my appreciation for her continued guidance and advice during the first months of my term. Both Mrs. Vosburgh and I have enjoyed the association with Dr. Demartini, Dr. Charles T. Ryder and Mr. Noroian, and are grateful for their support and encouragement. We would also like to thank Mrs. Kathleen Thompson of Public Interest who so efficiently handles all our secretarial problems and serves as a source of information on all things pertaining to the Medical Center. Above all, we wish to thank the dedicated chairmen of committees and all members who have so loyally served in every capacity in order to further the work of the Auxiliary.

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INSTRUCTORS
James John Jan, D.D.S.
Gilbert Kunken, D.D.S.
John Hsueh-Jen Liao Lee, D.D.S.
Wallace G. Smith, D.M.D.

Appendix

THE PRESBYTERIAN HOSPITAL

Balance

DECEMBER

EXHIBIT A

ASSETS	1979	1978
	(In Thousands)	
UNRESTRICTED FUNDS		
Current:		
Cash	\$ 1,118	\$ 311
Investments	345	956
Accounts receivable	37,869	37,096
Allowance for uncollectible accounts	(4,859)	(6,565)
Inventories	2,439	1,878
Accrued interest and prepaid expenses	3,286	2,603
Total current assets	40,198	36,279
Other:		
Investments	11,514	15,995
Property, plant and equipment—net	76,827	78,495
TOTAL UNRESTRICTED FUNDS	<u>\$128,539</u>	<u>\$130,769</u>
RESTRICTED FUNDS		
SPECIFIC PURPOSE FUNDS		
Cash	\$ 603	\$ 487
Investments	23,806	20,333
Due from unrestricted funds	6,930	7,773
TOTAL SPECIFIC PURPOSE FUNDS	<u>\$ 31,339</u>	<u>\$ 28,593</u>
PLANT REPLACEMENT AND EXPANSION FUNDS		
Investments	\$ 36,657	\$ 31,045
Pledge receivable		400
TOTAL PLANT REPLACEMENT AND EXPANSION FUNDS	<u>\$ 36,657</u>	<u>\$ 31,445</u>
ENDOWMENT FUNDS		
Cash	\$ 1	\$ 544
Investments	67,312	74,844
TOTAL ENDOWMENT FUNDS	<u>\$ 67,313</u>	<u>\$ 75,388</u>

See Notes to Financial Statements.

THE CITY OF NEW YORK

neets

9 AND 1978

EXHIBIT A

LIABILITIES AND FUND BALANCES

1979

1978

(In Thousands)

UNRESTRICTED FUNDS

Current:

Accounts payable	\$ 14,767	\$ 11,159
Accrued payroll and vacation pay	4,897	1,774
Due to specific purpose funds	6,930	7,773
Total current liabilities	<u>26,594</u>	<u>20,706</u>

Fund balances (Exhibit C):

Operating funds	13,604	15,573
Board-designated funds	11,514	15,995
Invested in property, plant and equipment	76,827	78,495
Total fund balances	<u>101,945</u>	<u>110,063</u>

TOTAL UNRESTRICTED FUNDS	<u>\$128,539</u>	<u>\$130,769</u>
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RESTRICTED FUNDS

SPECIFIC PURPOSE FUNDS

Fund balances (Exhibit D)	<u>\$ 31,339</u>	<u>\$ 28,593</u>
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TOTAL SPECIFIC PURPOSE FUNDS	<u>\$ 31,339</u>	<u>\$ 28,593</u>
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PLANT REPLACEMENT AND EXPANSION FUNDS

Fund balances (Exhibit D):

Replacement fund	\$ 32,329	\$ 27,772
Building funds	4,328	3,673

TOTAL PLANT REPLACEMENT AND EXPANSION FUNDS	<u>\$ 36,657</u>	<u>\$ 31,445</u>
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ENDOWMENT FUNDS

Fund balances (Exhibit D)	<u>\$ 67,313</u>	<u>\$ 75,388</u>
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TOTAL ENDOWMENT FUNDS	<u>\$ 67,313</u>	<u>\$ 75,388</u>
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See Notes to Financial Statements.

EXHIBIT B

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

STATEMENTS OF OPERATING REVENUES AND EXPENSES

For The Years Ended December 31, 1979 and 1978

(In Thousands)

	<u>1979</u>	<u>1978</u>
OPERATING REVENUES:		
Patient service revenues	\$170,390	\$160,404
Less allowances and uncollectible accounts:		
Contractual	11,021	13,088
Uncollectible accounts	4,500	6,300
Other (free care, etc.)	10,602	9,023
Total allowances and uncollectible accounts	<u>26,123</u>	<u>28,411</u>
Net patient service revenues	144,267	131,993
Other services	8,535	7,750
Transfers from specific purpose funds	<u>3,584</u>	<u>3,410</u>
Total operating revenues	<u>156,386</u>	<u>143,153</u>
OPERATING EXPENSES:		
Administration	6,037	6,288
Information systems	3,846	2,968
Personnel and protective	2,460	2,299
Finance	7,611	7,393
Nursing	46,398	42,199
Support services	31,188	29,672
Ancillary services	29,561	27,104
Medical affairs	28,560	26,068
Depreciation	<u>6,887</u>	<u>7,059</u>
Total operating expenses	<u>162,548</u>	<u>151,050</u>
LOSS FROM OPERATIONS	<u>\$ (6,162)</u>	<u>\$ (7,897)</u>

See Notes to Financial Statements.

EXHIBIT D

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK
STATEMENTS OF CHANGES IN RESTRICTED FUND BALANCES

For The Years Ended December 31, 1979 and 1978

(In Thousands)

SPECIFIC PURPOSE FUNDS

(For Research, Educational and Other Purposes)

	<u>1979</u>	<u>1978</u>
BALANCE, JANUARY 1	\$28,593	\$24,100
ADD:		
Legacies, contributions, grants, etc	3,786	5,183
Received from Columbia-Presbyterian Medical Center Fund, Inc.	290	53
Investment income	3,279	2,462
Funding of estimated liability for malpractice claims		1,596
Realized net gain on sales of investments	99	280
Cumulative effect on prior years of change in method of accounting for investments	120	
Total additions	<u>7,574</u>	<u>9,574</u>
DEDUCT:		
Transfers to unrestricted funds for:		
Operating revenues	3,584	3,410
Payment of patient accounts	881	667
Additions to property, plant and equipment	348	254
Transfers to (from) other funds—net	229	(141)
Unrealized net depreciation of investments		224
Other—net	(214)	667
Total deductions	<u>4,828</u>	<u>5,081</u>
BALANCE, DECEMBER 31	<u>\$31,339</u>	<u>\$28,593</u>

PLANT REPLACEMENT AND EXPANSION FUNDS

REPLACEMENT FUND:		
Balance, January 1	\$27,772	\$21,054
ADD:		
Funding of depreciation	6,887	7,059
Investment income	2,053	1,286
Realized net gain on sales of investments	298	702
Unrealized net appreciation of investments		518
Total additions	<u>9,238</u>	<u>9,565</u>
Deduct:		
Cumulative effect on prior years of change in method of accounting for investments	248	
Transfers to unrestricted funds for additions to property, plant and equipment	4,433	2,847
Total deductions	<u>4,681</u>	<u>2,847</u>
Balance, December 31	<u>\$32,329</u>	<u>\$27,772</u>

EXHIBIT D

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK
STATEMENTS OF CHANGES IN RESTRICTED FUND BALANCES

For The Years Ended December 31, 1979 and 1978

(In Thousands)

PLANT REPLACEMENT AND EXPANSION FUNDS

	<u>1979</u>	<u>1978</u>
BUILDING FUNDS:		
Balance (deficit), January 1	\$ 3,673	\$(6,044)
Add:		
Legacies and contributions	528	579
Received from Columbia-Presbyterian Medical Center Fund, Inc. ...	438	924
Investment income	369	143
Transfers from (to) other funds—net	224	(144)
Unrealized net appreciation of investments		146
Transfer from unrestricted funds in liquidation of loans		8,450
Total additions	<u>1,559</u>	<u>10,098</u>
Deduct:		
Transfers to unrestricted funds for additions to property, plant and equipment	438	185
Cumulative effect on prior years of change in method of accounting for investments	72	
Other—net	394	196
Total deductions	<u>904</u>	<u>381</u>
Balance, December 31	<u>\$ 4,328</u>	<u>\$ 3,673</u>

ENDOWMENT FUNDS

BALANCE, JANUARY 1	\$75,388	\$71,389
ADD:		
Legacies and contributions	2,479	208
Received from Columbia-Presbyterian Medical Center Fund, Inc. ...	40	
Realized net gain on sales of investments	770	2,191
Unrealized net appreciation of investments		1,597
Transfers from other funds—net	5	3
Total additions	<u>3,294</u>	<u>3,999</u>
DEDUCT—Cumulative effect on prior years of change in method of accounting for investments	11,369	
BALANCE, DECEMBER 31	<u>\$67,313</u>	<u>\$75,388</u>

See Notes to Financial Statements.

EXHIBIT E

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

STATEMENTS OF CHANGES IN FINANCIAL POSITION OF
UNRESTRICTED FUNDS

For The Years Ended December 31, 1979 and 1978

(In Thousands)

	<u>1979</u>	<u>1978</u>
FUNDS PROVIDED:		
Decrease in other investments:		
Cumulative effect on prior years of change in method of accounting for investments	\$ 4,995	
Increase in investments—net	(514)	\$ (1,536)
Sub-total	4,481	(1,536)
Transfer from restricted funds for additions to property, plant and equipment	5,219	3,286
Decrease in due from restricted building funds		8,450
Increase in accounts payable	3,608	3,958
Increase in accrued payroll and vacation pay	3,123	89
Total funds provided	<u>16,431</u>	<u>14,247</u>
FUNDS APPLIED:		
Loss from operations (including funding of depreciation)	6,162	7,897
Non-operating revenues	(6,785)	(7,013)
Sub-total	(623)	884
Cumulative effect on prior years of change in method of accounting for vacation pay	2,078	
Funds applied to operations	1,455	884
Cumulative effect on prior years of change in method of accounting for investments	4,995	
Additions to property, plant and equipment—net	5,219	2,520
Transfer to restricted building funds		8,450
Increase in accounts receivable—net	2,479	3,499
Increase in inventories	561	300
Increase in accrued interest and prepaid expenses	683	1,111
Decrease (increase) in due to specific purpose funds	843	(1,931)
Total funds applied	<u>16,235</u>	<u>14,833</u>
INCREASE (DECREASE) IN CASH AND CURRENT INVESTMENTS	196	(586)
CASH AND CURRENT INVESTMENTS, JANUARY 1	1,267	1,853
CASH AND CURRENT INVESTMENTS, DECEMBER 31	<u>\$ 1,463</u>	<u>\$ 1,267</u>

See Notes to Financial Statements.

EXHIBIT F

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK
NOTES TO FINANCIAL STATEMENTS

DECEMBER 31, 1979 AND 1978

I. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

The Presbyterian Hospital in the City of New York follows fund accounting principles as are customary for similar not-for-profit entities. Significant accounting policies employed in applying such principles are as follows:

(a) Classification of Funds

Funds classified as unrestricted represent funds available for any hospital purpose as distinguished from funds restricted externally for certain operating, endowment, and plant replacement and expansion purposes. Board-designated funds represent unrestricted funds appropriated by the Board of Trustees for plant replacement and other purposes. Unrestricted gifts designated by the Board of Trustees for particular purposes are reported as revenues of board-designated funds.

(b) Investments and Related Income

As of January 1, 1979, the Hospital changed its method of accounting for investments to the lower of cost or market value method for marketable equity securities and to the cost method for other investments. In 1978 and prior years, investments were carried at market. The new method of accounting was adopted because, in the opinion of the Hospital, it more accurately reflects its investment resources. The effect of the change in accounting on the unrestricted funds and restricted funds is reflected in the Statements of Revenues and Expenses and Changes in Unrestricted Fund Balances (as a change in fund balance) and the Statements of Changes in Restricted Fund Balances, respectively. (See Note 2)

Realized gains or losses and investment income are distributed to the general funds, board-designated funds, or restricted funds, as applicable. The cost of the securities sold was based on the average cost of all the shares of each such security held at the time of sale.

(c) Inventories

Inventories are carried principally at the lower of first-in, first-out cost or market.

(d) Property, Plant and Equipment

Property, plant and equipment are carried at cost less accumulated depreciation. The straight line method of depreciation is utilized for all depreciable assets, except items of movable equipment which are depreciated on the double declining balance method. The restricted replacement fund represents depreciation funded as required by certain third-party payors, less capital acquisitions charged to the fund.

(e) Pensions

The Hospital has a non-contributory retirement plan covering all non-union and certain union employees. The Hospital accrues and funds current service costs and the amortization of unfunded prior service cost over a period of 30 years. As of January 1, 1979, the date of the latest actuarial valuation of the plan, the actuarially computed value of vested benefits exceeded assets held in the Retirement Fund Trust and insurance company reserves by \$3,591,000. The Hospital also makes payments to union plans for retirement benefits of union employees.

The Hospital's pension expense was \$5,210,000 in 1979 and \$4,620,000 in 1978.

EXHIBIT F (continued)

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK
NOTES TO FINANCIAL STATEMENTS
DECEMBER 31, 1979 AND 1978

(f) Vacation Pay

Effective January 1, 1979 the Hospital changed its method of accounting for payments to employees for vacation pay from the cash method to the accrual method in order to recognize the liability for estimated probable future payments attributable to employees' services during the current and preceding periods. (See Note 4)

(g) Contributions and Legacies

Unrestricted contributions and legacies are included in non-operating revenues in the Statements of Revenues and Expenses and Changes in Unrestricted Fund Balances. Contributions and legacies received for specific operating or other purposes are credited to the appropriate fund.

(h) Funds held in Trust by Others

Non-discretionary trusts held by others from which the Hospital receives income are not carried in the accounts of the Hospital. The market value of such trusts was approximately \$3,300,000 at December 31, 1979.

2. INVESTMENTS

At December 31, 1979 investment amounts shown in the accompanying financial statements were carried at cost; at December 31, 1978, they were carried at market value. The Hospital maintains a consolidated investment account (pool) for substantially all of its security investments. Such pool is administered under the principles governing a common trust fund. For purposes of reporting the cost, market value, and other information on investments held by the unrestricted and restricted funds, amounts are allocated to specific fund categories primarily based on the number of units held.

At December 31, 1979 the cost and market value of investments (cost is carrying value) were as follows:

	<u>Cost</u>	<u>Market</u>
	(in thousands)	
Unrestricted funds—current	\$ 345	\$ 345
Unrestricted funds—non current	11,514	16,833
Specific purpose funds	23,806	23,736
Plant replacement and expansion funds	36,657	37,951
Endowment funds	67,312	80,243

At December 31, 1979, gross unrealized gains and losses pertaining to the marketable equity security portfolios included in total investments were as follows:

	<u>Gains</u>	<u>Losses</u>
	(in thousands)	
Unrestricted funds—non current	\$ 3,503	\$ 726
Specific purpose funds	2,234	463
Plant replacement and expansion funds	6,962	1,444
Endowment funds	16,691	3,461

EXHIBIT F (Continued)

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK
NOTES TO FINANCIAL STATEMENTS

DECEMBER 31, 1979 AND 1978

At December 31, 1978, the market value and cost of investments (market is the carrying value) were as follows:

	<u>Market</u>	<u>Cost</u>
	(in thousands)	
Unrestricted funds—current	\$ 956	\$ 956
Unrestricted funds—non current	15,995	11,000
Specific purpose funds	20,333	20,453
Plant replacement and expansion funds	31,045	30,726
Endowment funds	74,844	63,474

3. PROPERTY, PLANT AND EQUIPMENT

Property, plant and equipment consisted of the following at December 31:

	<u>1979</u>	<u>1978</u>
	(in thousands)	
Land and improvements	\$ 3,593	\$ 3,591
Buildings	64,987	64,698
Fixed equipment	48,929	46,922
Movable equipment	25,773	24,521
Total	143,282	139,732
Less accumulated depreciation	69,538	63,895
Total	73,744	75,837
Construction in progress	3,083	2,658
Total	<u>\$ 76,827</u>	<u>\$ 78,495</u>

4. VACATION PAY

The nonrecurring effect of the change in method of accounting for vacation pay for the years 1978 and prior of \$2,078,000 (net of estimated Medicare reimbursement of \$354,000) is included as a Cumulative Effect on Prior Years of Change in Method of Accounting for Vacation Pay in the Statement of Revenues and Expenses and Changes in Unrestricted Fund Balances for the year ended December 31, 1979. In future years the operating results will reflect only the net change in the vacation pay accrual in each year.

The effect of the change in method on the excess of revenues over expenses before the cumulative effect adjustment for the year ended December 31, 1979 and the excess of revenues over expenses for the year ended December 31, 1978, had the change been applied previously, is not significant.

5. MALPRACTICE AND GENERAL LIABILITY INSURANCE

Effective July 1, 1978, the Hospital obtained malpractice and general liability coverage through a commercial insurance company which was reinsured through a captive insurance company which was organized in cooperation with several other hospitals. The primary insurance coverage provides \$1,000,000 per occurrence/\$15,000,000 aggregate coverage to the hospitals and is financed by premiums paid by each of the participating institutions. An additional \$45,000,000 aggregate excess coverage was collectively purchased through other commercial insurance companies.

For the year ended December 31, 1979 and for the six months ended December 31, 1978, the Hospital charged to operations malpractice and general liability insurance premiums (including amounts for excess commercial coverage) of \$2,510,000 and \$1,239,000, respectively.

EXHIBIT F (continued)

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

NOTES TO FINANCIAL STATEMENTS

DECEMBER 31, 1979 AND 1978

For the six-month period ended June 30, 1978 the Hospital was self-insured for malpractice claims of up to \$11,000,000 per occurrence/\$11,500,000 aggregate. Commercial insurance was purchased to obtain insurance coverage in excess of self-insured retention levels. The Hospital charged to operations during the six month period ended June 30, 1978 a provision of \$1,596,000 representing actuarially determined estimates of liability relating to claims, both asserted and unasserted, resulting from incidents that occurred during such periods. This provision and those of prior years during which the Hospital was self-insured have been funded and are included in the specific purpose funds in the accompanying financial statements. Fund balances for the estimated liability for malpractice claims applicable to the self-insurance period were approximately \$10,200,000 and \$9,700,000 at December 31, 1979 and 1978, respectively. The Hospital paid excess commercial coverage premiums of \$438,000 for the six-months ended June 30, 1978.

Prior to July 1, 1978, the Hospital's malpractice and general liability coverage was on an occurrence basis; subsequent to that date, insurance is provided basically on a claims-made basis. Claims based on occurrences prior to July 1, 1978 are insured under conventional insurance or self-insurance coverage. Should the claims-made policies not be renewed or replaced with equivalent insurance, claims based on occurrences during the term of the policies but reported subsequently will be uninsured.

6. LEASES

The Hospital leases data processing and certain other equipment. Total rental expense during 1979 and 1978 was \$1,400,000 and \$1,090,000, respectively.

7. RECLASSIFICATIONS

For purposes of comparison, certain 1978 amounts, as previously reported, have been reclassified in the accompanying financial statements.

AUDITORS' OPINION

THE PRESBYTERIAN HOSPITAL
IN THE CITY OF NEW YORK:

We have examined the balance sheets of The Presbyterian Hospital in the City of New York as of December 31, 1979 and 1978 and the related statements of operating revenues and expenses, revenues and expenses and changes in unrestricted fund balances, changes in restricted fund balances, and changes in financial position of unrestricted funds for the years then ended. Our examinations were made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, such financial statements present fairly the financial position of the Hospital at December 31, 1979 and 1978 and the results of its operations and the changes in financial position of its unrestricted funds for the years then ended, in conformity with generally accepted accounting principles applied on a consistent basis except for the changes, with which we concur, in the method of accounting for investments and vacation pay as described in Notes 1, 2 and 4 to the financial statements.

February 12, 1980

DELOITTE HASKINS & SELLS
Certified Public Accountants

REPORT OF THE AUDITING COMMITTEE

TO THE BOARD OF TRUSTEES OF THE PRESBYTERIAN HOSPITAL
IN THE CITY OF NEW YORK:

Pursuant to Article VII of the By-Laws of The Presbyterian Hospital in the City of New York, the undersigned Auditing Committee appointed by your Board selected, with your approval, the firm of Deloitte Haskins & Sells, as independent certified public accountants, to make an examination of the financial statements of The Presbyterian Hospital in the City of New York for 1979.

We submit herewith, after due consideration by the Committee, an opinion of Deloitte Haskins & Sells, dated February 12, 1980, relating to the Corporation's financial statements, including the balance sheets, and the related statements of operating revenues and expenses, revenues and expenses and changes in unrestricted fund balances, changes in restricted fund balances and changes in financial position of unrestricted funds for the year ended December 31, 1979.

Your Committee recommends that the opinion and financial statements be accepted and approved.

New York, N.Y.
March 18, 1980

HULBERT S. ALDRICH, Chairman
EDWARD H. AUCHINCLOSS

GEORGE S. DILLON
ROBERT WINTHROP
Auditing Committee

IN-PATIENT STATISTICS

Year 1979

	<i>Admissions</i>	<i>Patient Days</i>	<i>Average Length of Stay</i>
Dermatology	410	6,941	17.10
Medicine	7,758	90,892	12.09
Neurological Surgery	1,150	20,067	15.89
Neurology	2,527	40,568	17.49
Obstetrics & Gynecology	7,256	32,421	4.46
Ophthalmology	2,695	11,419	4.26
Orthopedic Surgery	4,027	50,937	12.77
Otolaryngology	1,226	6,102	4.99
Pediatrics	5,720	43,813	7.36
Psychiatry	146	4,432	26.07
Rehabilitation Medicine	25	5,135	49.85
Surgery	6,346	67,152	10.30
Urology	2,421	17,910	7.33
Radiotherapy	<u>5</u>	<u>70</u>	<u>14.00</u>
Total	<u>41,712</u>	<u>397,859</u>	<u>9.50</u>

	<i>Bed Complement*</i>	<i>Admissions</i>	<i>Patient Days</i>	<i>Percentage of Occupancy</i>	<i>Average Length of Stay</i>
Private	287	9,333	88,631	84.6	9.13
Semi-Private	673	21,689	207,089	84.3	9.60
Ward	<u>331</u>	<u>10,690</u>	<u>102,139</u>	<u>84.5</u>	<u>9.65</u>
Total	<u>1,291</u>	<u>41,712</u>	<u>397,859</u>	<u>84.4</u>	<u>9.50</u>
Nursery	<u>48</u>	<u>3,046</u>	<u>12,445</u>	<u>71.0</u>	<u>4.34</u>

* As of December 31.

Ambulatory Statistics

			1979	1978
VANDERBILT CLINIC:				
Summary of Patients Treated:				
Number of Patients Treated			110,565	105,597
Number of Visits:				
Medicaid			146,497	136,269
Medicare			74,867	69,491
Blue Cross and Blue Shield			5,250	5,704
Charges and miscellaneous agencies			69,933	65,714
Full Pay			6,994	6,281
Part Pay			61,545	52,166
Free, transfers and follow ups			255	4,910
Personnel and dependents			21,674	17,959
Total			<u>387,015</u>	<u>358,494</u>
	<i>Doctors'</i>		<i>1979</i>	<i>1978</i>
	<i>Offices</i>	<i>Clinic</i>	<i>Total</i>	<i>Total</i>
			<i>Visits</i>	<i>Visits</i>
VANDERBILT CLINIC AND DOCTORS' OFFICES:				
Number of Visits:				
Dentistry	2,897	—	2,897	2,802
Dermatology	15,353	15,788	31,141	28,308
Emergency—Adults	—	70,745	70,745	67,689
Emergency—Pediatrics	—	44,016	44,016	38,439
Group Clinic	—	31,525	31,525	26,508
Medicine	32,357	24,439	56,796	53,581
Neurology	15,621	12,651	28,272	26,245
Obstetrics and Gynecology	37,369	38,570	75,939	68,539
Ophthalmology	43,558	24,682	68,240	68,552
Orthopedic	28,875	25,277	54,152	53,194
Otolaryngology	17,566	12,659	30,225	28,759
Pediatrics	14,715	24,933	39,648	35,744
Physical Medicine and Rehabilitation	139	11,861	12,000	11,088
Psychiatry	11,224	20,622	31,846	27,125
Radiotherapy	—	865	865	4,378
Surgery	30,432	21,333	51,765	51,489
Urology	9,266	7,049	16,315	16,350
Funded Programs	2,000	—	2,000	2,303
Total	<u>261,372</u>	<u>387,015</u>	<u>648,387</u>	<u>611,093</u>

Personnel Statistics

		On Duty December 31	
		1979	1978
Administration		24	24
Assistant Secretary-Treasurer		175	180
Comptroller		229	232
Public Interest		19	26
Non-professional services:			
Buildings and grounds		626	623
Food service		302	292
Personnel and protective		127	131
Other non-professional services		144	113
Professional services:			
Nursing		2,099	2,157
Professional staff, doctors' offices and research		574	625
Special services		989	876
Vanderbilt Clinic and other		507	474
Total		<u>5,815</u>	<u>5,753</u>
Students:			
Department of Nursing, Faculty of Medicine, Columbia University		310	306
The Edna McConnell Clark School of Nursing:			
Practical Nursing		—	45
Associate Degree Nursing		57	37
Presbyterian Hospital School of:			
Radiologic Technology		13	15
Operating Room Technology		7	9
Orthoptic and Ophthalmic Assistants		—	2
Electroencephalographic Technology		3	—
Total		<u>390</u>	<u>414</u>

BOARD OF WOMEN MANAGERS OF THE BABIES HOSPITAL

(Including Cribside Social Service Committee)

SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

For the Years Ended December 31, 1979 and 1978

	<u>1979</u>	<u>1978</u>
Balance, January 1	\$18,063.84	\$12,397.10
Receipts:		
Membership Dues	2,020.00	1,575.00
Donations	500.00	600.00
United Hospital Fund:		
Direct Benefit	8,722.00	5,928.00
Free Care Distribution	1,185.79	2,580.00
Greater New York Fund	10,279.55	17,680.00
Investment Income	1,609.40	1,308.28
Transfer from Emergency Nursing Fund		4,000.00
Total Receipts	<u>24,316.74</u>	<u>33,671.28</u>
Disbursements:		
Care of Ward and Clinic Patients	8,722.00	5,928.00
Pediatric Psychiatric Clinic	1,500.00	1,500.00
Volunteers	500.00	500.00
Recreational Therapy	4,500.00	4,500.00
Social Service Expenditures	9,057.24	15,011.64
Miscellaneous	272.50	564.90
Total Disbursements	<u>24,551.74</u>	<u>28,004.54</u>
Balance, December 31	<u>\$17,828.84</u>	<u>\$18,063.84</u>

EMERGENCY NURSING FUND—BABIES HOSPITAL

Balance, January 1	\$10,264.06	\$17,714.06
Receipts:		
Donations		550.00
Total Receipts		<u>550.00</u>
Disbursements:		
Transfer to the Discretionary Fund (Beaupre Charitable Trust)		4,000.00
Transfer to the Auxiliary General Account		4,000.00
Total Disbursements		<u>8,000.00</u>
Balance, December 31	<u>\$10,264.06</u>	<u>\$10,264.06</u>

DISCRETIONARY FUND OF THE BABIES HOSPITAL BOARD OF WOMEN MANAGERS

Balance, January 1	\$35,053.57	\$21,704.45
Receipts:		
Theater Benefit	5,425.07	25,691.00
Donations	1,080.27	2,000.00
Investment Income	1,041.65	
Transfer from Lecture Fund	5,288.00	5,320.12
Transfer from Emergency Nursing Fund (Beaupre Charitable Trust)		4,000.00
Total Receipts	<u>12,834.99</u>	<u>37,011.12</u>
Disbursements:		
Benefit Expenses	1,296.38	10,276.96
Salary—Recreational Therapist	9,943.36	9,819.04
Pediatric Clinic Recreational Therapy Fund	1,125.44	
Five Window Air Conditioning Units		3,566.00
Total Disbursements	<u>12,365.18</u>	<u>23,662.00</u>
Balance, December 31	<u>\$35,523.38</u>	<u>\$35,053.57</u>

NEUROLOGICAL INSTITUTE AUXILIARY
SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

For the Years Ended December 31, 1979 and 1978

	<u>1979</u>	<u>1978</u>
Balance, January 1	\$38,167.35	\$28,930.29
Receipts:		
Donations and Membership Dues	3,640.00	4,080.00
United Hospital Fund:		
Direct Benefit	10,000.00	15,302.00
Free Care Distribution	2,092.20	2,314.00
Greater New York Fund	18,137.16	15,864.00
Investment Income	272.97	221.89
Benefit	8,925.07	-
Everybody's Thrift Shop	20,395.25	17,501.52
Recreational Therapy Fund	15,184.41	5,790.07
Transfer from Special Fund	125.13	-
Total Receipts	<u>78,772.19</u>	<u>61,073.48</u>
Disbursements:		
Care of Ward and Clinic Patients		10,302.00
Neurological Institute Library	10,000.00	5,000.00
Library	8,000.00	8,000.00
Volunteer Service	1,900.00	1,900.00
Recreational Therapist Salary (Pediatric Neurology Clinic)	876.00	864.00
Recreational Therapist Salary (Neurological Institute)	15,184.41	5,790.07
Nurse Specialist—Neurology Clinic	5,000.00	5,000.00
Purchase of Electric Beds		3,493.50
Benefit	3,500.00	
Social Services Expenditures:		
Staff Development	15.00	300.00
Summer Camps		300.00
Transportation	341.20	447.20
Medical Appliances and Maintenance	356.28	282.00
Other	95.00	103.00
Refurbishing N.I. X-ray Department	196.75	7,445.05
Partition in N.I. Basement		310.00
Awards and Citations	565.69	520.21
Everybody's Thrift Shop	955.00	627.40
Spanish Translator	780.00	
Miscellaneous	718.10	1,151.99
Total Disbursements	<u>48,483.43</u>	<u>51,836.42</u>
Balance, December 31	<u>\$68,456.11</u>	<u>\$38,167.35</u>

SUSAN REDDY, Treasurer

WOMEN'S AUXILIARY OF THE NEW YORK ORTHOPEDIC HOSPITAL
SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

For the Years Ended December 31, 1979 and 1978

	<u>1979</u>	<u>1978</u>
Balance, January 1	\$24,551.27	\$13,661.66
Receipts:		
Donations	8,783.98	13,922.43
United Hospital Fund:		
Direct Benefit	15,532.00	15,609.00
Free Care Distribution	2,430.92	1,096.00
Greater New York Fund	21,073.53	7,511.00
Investment Income	3,232.30	2,627.53
Benefit	8,925.07	
Total Receipts	<u>59,977.80</u>	<u>40,765.96</u>
Disbursements:		
Care of Ward and Clinic Patients	15,532.00	15,609.00
Library	4,261.20	4,179.81
Volunteer Service	1,100.00	1,100.00
Recreational Therapy Expenses:		
Salary	16,036.09	8,334.88
Other Miscellaneous	(115.09)	312.49
Benefit	3,500.00	
Miscellaneous	150.00	340.17
Total Disbursements	<u>40,464.20</u>	<u>29,876.35</u>
Balance, December 31	<u>\$44,064.87</u>	<u>\$24,551.27</u>

ELIZABETH E. TILGHMAN, *Treasurer*

PRESBYTERIAN HOSPITAL AUXILIARY
SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

For the Years Ended December 31, 1979 and 1978

	<u>1979</u>	<u>1978</u>
Balance, January 1	\$38,339.99	\$23,931.46
Receipts:		
Membership Dues	1,690.00	1,490.00
Donations	50.00	33.00
United Hospital Fund:		
Direct Benefit	12,276.00	11,319.00
Free Care Distribution	2,954.09	1,455.00
Greater New York Fund	25,608.76	9,970.00
Auxiliary Benefit	5,425.09	18,698.00
Stuyvesant Square Thrift Shop	31,019.91	26,229.06
Shopping Cart	7,783.53	12,118.58
Total Receipts	<u>86,807.38</u>	<u>81,312.64</u>
Disbursements:		
Care of Ward and Clinic Patients	12,276.00	11,319.00
Parking for Volunteers	828.00	828.00
Library	10,050.00	10,050.00
Volunteer Service	7,200.00	7,200.00
Recreational Therapist Salary	16,589.62	15,575.85
Student Nurse Scholarship Fund	1,000.00	1,000.00
Anna Ball Kneeland Memorial Fund for Staff Development in Social Service	500.00	65.00
Emily Webster Fund	500.00	500.00
Blood Bank Education Fund	500.00	500.00
Audio-Visual Viewers and Cassettes for The Eye Institute		2,796.00
Auxiliary Benefit		6,759.97
Shopping Cart:		
Miscellaneous Sundries	4,412.02	8,429.85
Holiday Decoration		300.00
Cancer Development Fund		100.00
Stuyvesant Square Thrift Shop	780.40	727.83
Printing, Postage, Luncheon	677.37	442.45
Presbyterian Garden Fund		250.00
Art Show	150.00	60.16
Total Disbursements	<u>55,463.41</u>	<u>66,904.11</u>
Balance, December 31	<u>\$69,683.96</u>	<u>\$38,339.99</u>

ANNA BALL KNEELAND MEMORIAL FUND
FOR STAFF DEVELOPMENT IN SOCIAL SERVICE

Balance, January 1	\$91.69	\$368.54
Receipts:		
Presbyterian Hospital Auxiliary	500.00	65.00
Other	358.00	
Total Receipts	<u>858.00</u>	<u>65.00</u>
Disbursements:		
Symposium	120.00	341.85
Total Disbursements	<u>120.00</u>	<u>341.85</u>
Balance, December 31	<u>\$829.69</u>	<u>\$91.69</u>

IRENE B. SLAP, *Treasurer*

Endowed Beds and Rooms

1) A gift of \$10,000, specified for an endowed bed, shall entitle the donor to nominate patients to use and occupy a bed in the common wards of the Hospital, such use to be limited to the value of income earned and accumulated by that gift. Income shall accumulate annually. At the end of each calendar year, any income not utilized shall be used for free care for needy patients of the Hospital.

It is the policy of the Hospital that any insurance or other third-party medical benefits of patients nominated to use and occupy endowed beds be applied to charges incurred prior to the utilization of endowed bed benefits.

The donor may at the time of making the gift appoint to another in his stead such right to nominate, provided the appointee is acceptable to the Hospital.

Such right to nominate may be exercised only:

(a) During the life of the person having the right to nominate; or

(b) For a period of fifteen years, if such right is in a Corporation, Society or Association.

After the right to nominate expires, the entire fund, principal and income, shall be considered part of the unrestricted fund of the Hospital.

2) Endowed Bed privileges are subject to all rules and regulations governing the admission, treatment and discharge of patients.

3) The Board of Trustees may in their discretion under special circumstances accept gifts for the endowment of beds on such other terms and conditions as they may deem best calculated to promote the

objectives for which the Hospital was established and is maintained.

4) Periodic gifts may be made until endowment of a bed is completed, at which time the right to nominate shall commence.

Memorial Endowed Beds for Research Purposes

A gift of \$10,000 shall entitle the donor to establish a memorial endowed bed for research purposes in a ward of the Hospital.

The President of the Medical Board shall, subject to the approval of the President of the Hospital, have the privilege of nominating patients to use and occupy a Memorial Endowed Bed for Research Purposes, for a period of fifteen years, such use to be limited to the value of income earned and accumulated by the gift. Income from the gift shall accumulate until utilized, during the period in which nominating rights are in effect.

After the right to nominate expires, the entire fund, principal and income, shall be considered part of the unrestricted fund of the Hospital.

Endowed Rooms

The Board of Trustees may in their discretion under special circumstances accept gifts for the endowment of rooms on such terms and conditions as they may deem best calculated to promote the objectives for which the Hospital was established and is maintained.

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